

Canovision 8

SERVICE MANUAL

E57A/E90E,F

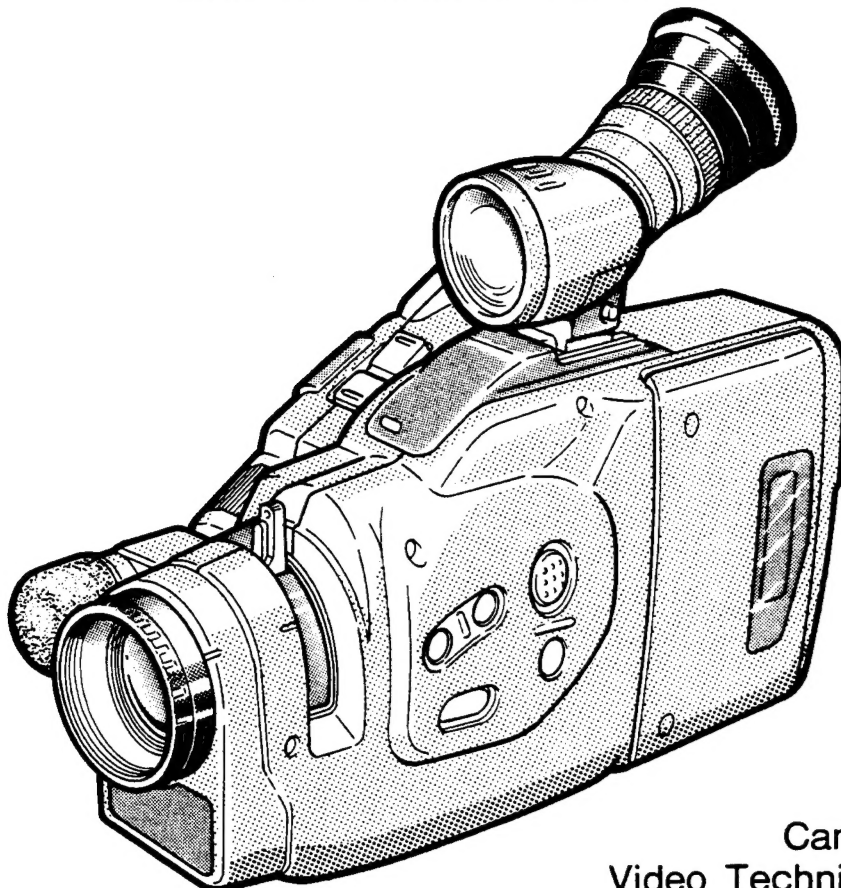
(REF. NO. D15-3712,3730,3770)

8mm Video Camera & Recorder

NTSC

PAL

F-PAL



DY8-1153-712-000
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Canon Inc.
Video Technical Service Dept.
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SAFETY PRECAUTIONS

The following precautions should be observed when servicing.

1. Since many parts in the unit have special safety-related characteristics, always use genuine CANON replacement parts.

Especially critical parts in the power circuit block should not be replaced with other makes.

Critical parts are marked with \triangle in the schematic diagrams.

2. The primary source of X-ray radiation in this viewfinder is the picture tube. The tube used in the viewfinder is especially constructed to limit X-ray radiation emission. For continued X-ray radiation protection, the replacement tube must be same type as the original, CANON approved one.
3. When servicing, observe the original lead dress. If a short circuit is found, replace all parts which have been overheated or damaged by the short circuit.
4. After servicing, see to it that all the protective devices such as insulation barriers, insulation papers shields are properly installed.
5. After servicing, make the following leakage current checks to prevent the customer from being exposed to shock hazards.

5-1 Leakage Current Cold Check

- 1) Unplug the AC cord and connect a jumper between the two prongs on the plug.
- 2) Measure the resistance value, with an ohmmeter, between the jumpered AC plug and each exposed metallic cabinet part on the equipment such as screwheads, connectors, control shafts, etc. When the exposed metallic part has a return path to the chassis, the reading should be between $1M\Omega$ and $5.2M\Omega$. When the exposed metal does not have a return path to the chassis, the reading must be ∞ .

5-2 Leakage Current Hot Check

- 1) Plug the AC cord directly into the AC outlet. Do not use an isolation transformer for this check.
- 2) Connect a $1.5K\Omega$ 10 watt resistor, paralleled by $0.15\mu F$ capacitor, between each exposed metallic parts on the unit and a good earth ground such as a water pipe, as shown in the figure below.
- 3) Use an AC voltmeter, with $1000\Omega/\text{volt}$ or more sensitivity, to measure the potential across the resistor.
- 4) Check all exposed metallic parts of the cover (Cable connection, Handle bracket, metallic cabinet. Screwheads, Metallic overlays, etc), and measure the voltage at each point.
- 5) Reverse the AC plug in the AC outlet and repeat each of the above measurements.
- 6) The potential at any point should not exceed 0.75V RMS.

A leakage current tester (FLUKE MODEL: 8000A equivalent) may be used to make the hot checks.

Leakage current must not exceed 0.5 milliamp.

In case a measurement is out side of the limits specified, there is a possibility of a shock hazard, and corrective action must be taken before returning the instrument to the customer.

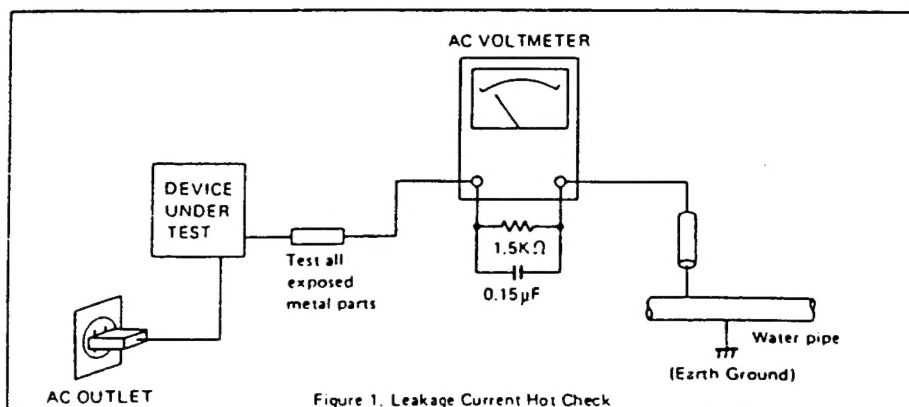


Figure 1. Leakage Current Hot Check

Introduction

1. This service manual is edited and compiled for the E57A and the E90E,F.
2. The reader using this manual is expected to use a service manual and service manual reports for the E30A/E30E,F.
(This service manual explains only the differences from the E30A/E30E,F.)
3. The E57A and the E90E,F is made by adding a 1/1000 speed shutter, video light (VL-6) and a compact 10x zoom lens to the E30.
(The 1/1000 speed shutter is employed for the E53A.)

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PREFACE

1. The VCC820 is the same as the Canon model E90E except the external cover.
2. This service manual is the same as that for the Canon model E90E expect the Parts Catalog section.
3. The VCC820 is made by adding a 1/1000 speed shutter, video light (VHL2) and a compact 10× zoom lens to the VCC810.

CHAPTER I. GENERAL DESCRIPTION OF PRODUCT

1. Product Overview

1-1 Major features

- 1) Excellent picture quality
 - ° High-performance 10x power zoom lens
 - ° Flying erase head
 - ° Full-auto white balancing (TTL)
 - ° Center-emphasis averaging photometry
- 2) Functionalities
 - ° 1/1000 sec. electronic speed shutter (1/1000 sec. speed shutter functions during the button is pressed.)
 - ° Near-infrared dual beam autofocusing
 - ° High-speed search (20x speed)
 - ° Linear time counter
 - ° Video-audio synchronous fading
 - ° Auto date/title character generation
 - ° Self interval timer
 - ° Video light (VL-6)
- 3) Operabilities
 - ° EVF built-in rotary "FlexiGrip"
 - ° Sports Finder (SF-200)
 - ° Wireless controller (WL-400)
 - ° Double function keys
 - ° Recording search
 - ° Recording reminder (10-sec counter)

1-2 Major characteristics of each section

Table I-1 shows the major characteristics of each section in Model E57A/E90E,F

Table I-1

Camera						Recorder	Grip circuit
	Lens	AF circuit	CCD	Sensor circuit	Process circuit		
E57A	10x tele-macro lens (New)	Shutter button and leaf switch (for infinity-end detection) is added to that of E30A, that is, the leaf switch is added to that of E53A.	Same as that of E06 and E53A.	Shutter circuit is added to that of E30A. (Same as that of E53A)	Same as that of E30A.	Same as that of E30A.	Video light drive circuit is added to that of E30A.
E90E,F	10x tele-macro lens (New)	Shutter button and leaf switch (for infinity-end detection) is added to that of E30E,F.	Same as that of E6E,F.	Shutter circuit is added to that of E30E,F.	Same as that of E30E,F.	Same as that of E30E,F.	Video light drive circuit is added to that of E30E,F.

2. Comparison with E30A/E50A

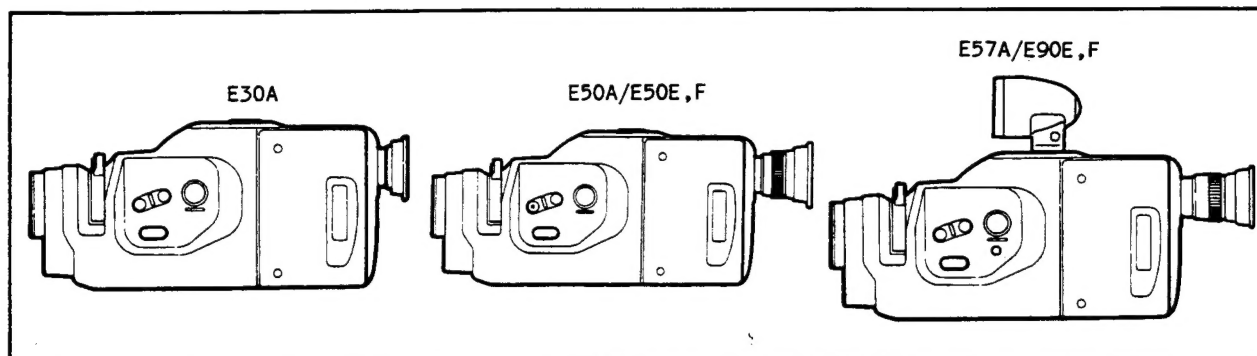


Fig. I-1

2-1 Outer appearance

Dimensions

(W x D x H)

4-1/2 x 11-1/5 x 4-3/4 in.
(115 x 285 x 121 mm)

4-1/2 x 11-4/5 x 4-3/4 in.
(115 x 300 x 121 mm)

4-1/2 x 11-4/5 x 4-3/4 in.
(115 x 300 x 121 mm ... Body only)

Weight

Approx. 2.4 lb.
(approx. 1.1 kg)

Approx. 2.42 lb.
(approx. 1.1 kg)

Approx. 2.54 lb.
(approx. 1.15 kg ... Body only)

Body color

Dark grey

Iron black

Iron black

2-2 Lens

Focal length

9 mm to 54 mm (6x)

8.5 mm to 68 mm (8x)

8.5 mm to 85 mm (10x)

Aperture ratio

1:1.4
(F1.9 at telephoto-end)

1:1.4
(F2.4 at telephoto-end)

1:1.6
(F2.6 at telephoto-end)

Macro

Wide macro

Wide macro

Wide macro

2-3 Finder

Sports finder

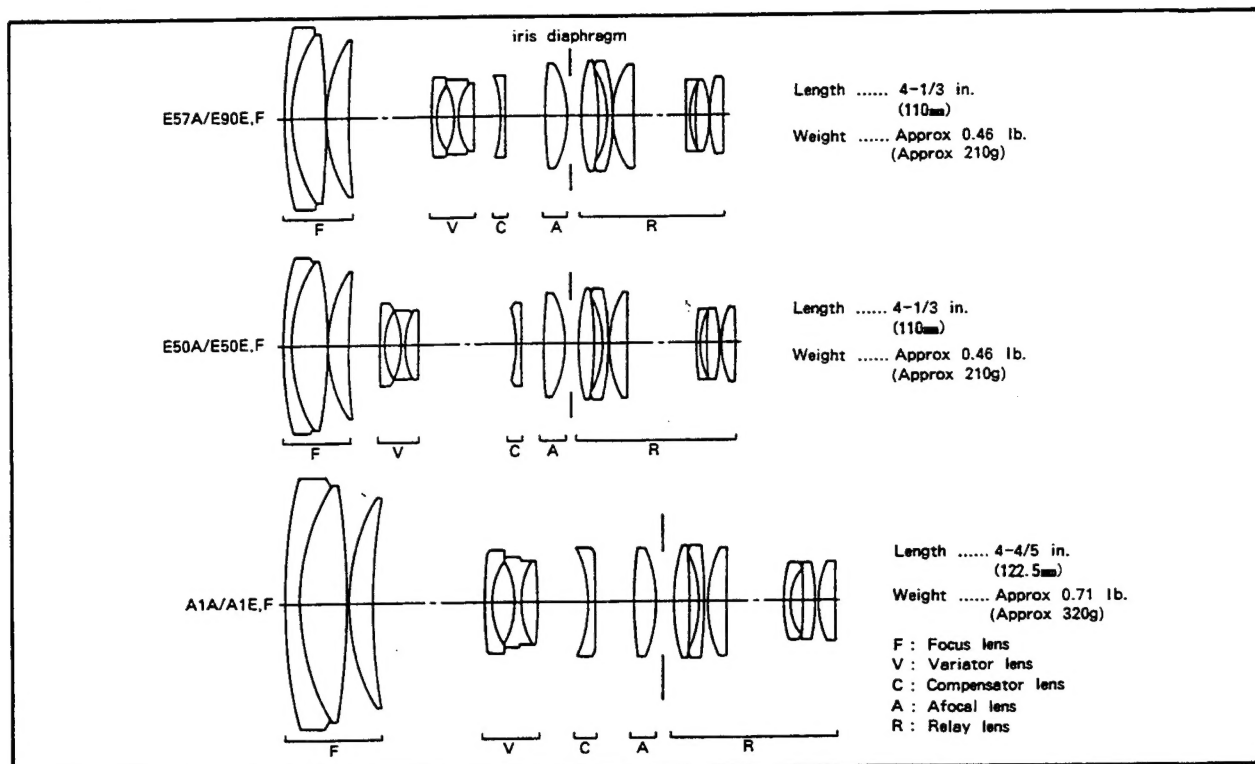
Optional

Provided
(SF-200)

Provided
(SF-200)

3. New Technology

3-1 Optics



The 57A/E90E,F employ the compact zoom lens of 10x which is almost the same as that employed for the E50 (8x) in length and weight.

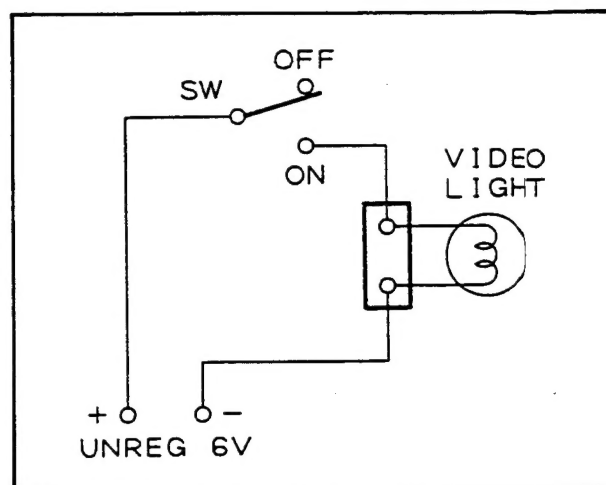
Comparing the 10x lens for the A1, the length is made shorter by 12.5 mm, and the weight is lighter by 110 g (approx.). This compactness is came true by strengthen the refractive index of front lenses (for focusing) and variator lenses (for zooming). Accordingly, the full length of optical system becomes shorter and almost the same compactness and lightness as the 8x lens for the E50 is realized.

3-2 Video light

The video light is equipped in order to create a high quality picture even under the low illumination.

The video light can be used only with a battery pack.

(As the current consumption exceeds that of CA-E7 and CB-E7, do not use these power sources when the video light is used. To protect the circuit from the excess current by misuse, a current amount detector switch is equipped on the GRIP C.B.A. This switch is turned on only the battery pack is used.)



CHAPTER II. DISASSEMBLING

* Notes: Except the camera section, the all sections can be disassembled in the same procedures as that of E30. However, for enhancing the quality of product, perform the following two procedures when reassembling.

1. Make a wiring of code (Pin 2) from the top cover as shown in the Fig. II-1.
(The wiring should be made apart from IC402, CN402 and CN605.)
2. To avoid the Process Shield touching with the AF motor, secure the Process Shield with a tape (at 2 points). Then, rewire the IRED codes (2 lines) and the infinity switch codes (2 lines).

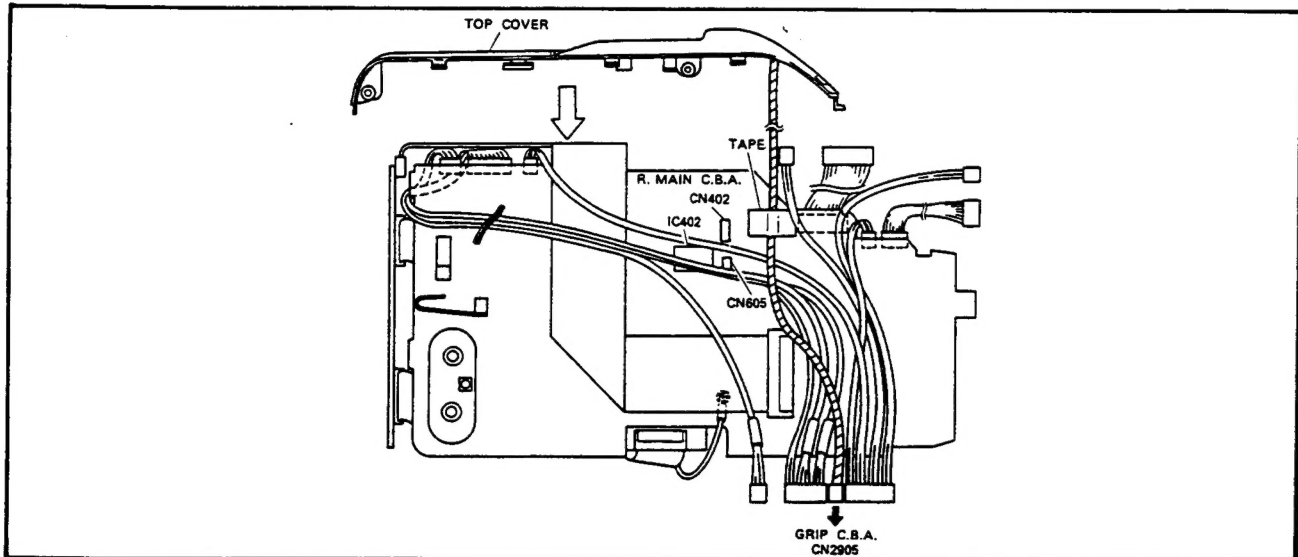


Fig. II-1

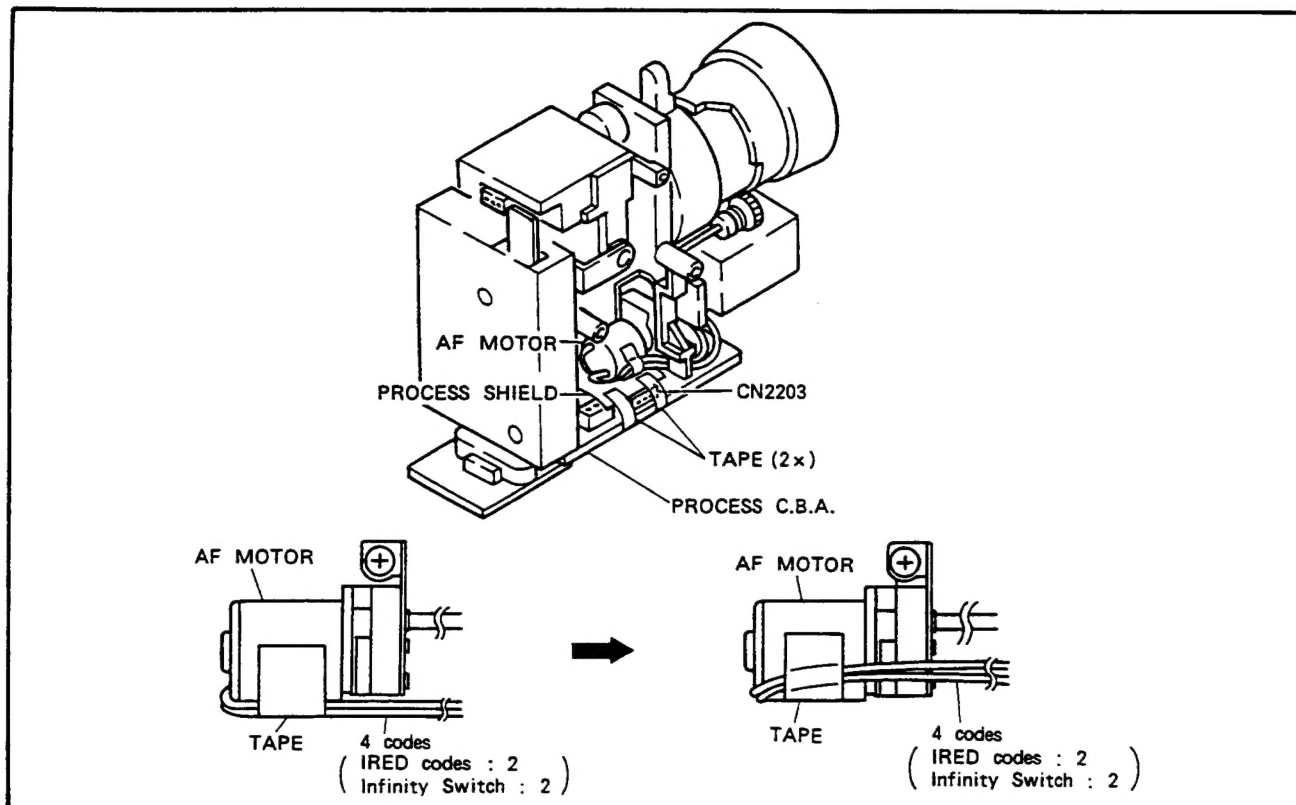


Fig. II-2

1. Disassembling of Camera Section

1-1 Removal of camera holder (2) and PROCESS C.B.A.

- (1) To detach the camera holder (2), remove two screws (j).
- (2) Detach the PROCESS C.B.A.
- (3) Unplug the connectors between the lens unit and the PROCESS C.B.A. (x1)

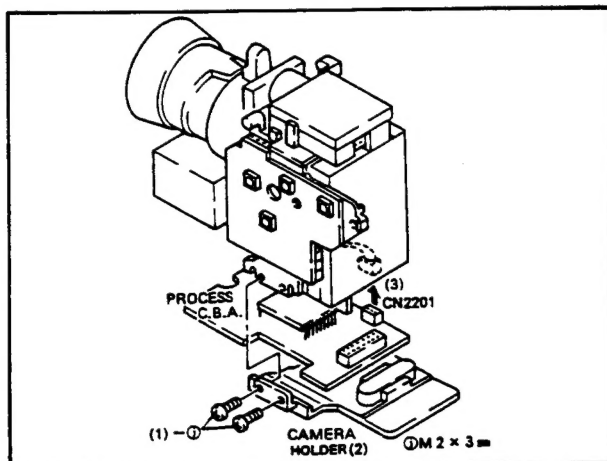


Fig. II-3

1-2 Removal of PROCESS SHIELD and DC/DC converter

- (1) Remove a screw (k).
- (2) Detach the PROCESS SHIELD.
- (3) To detach the DC/DC converter, unhook the claw (A).

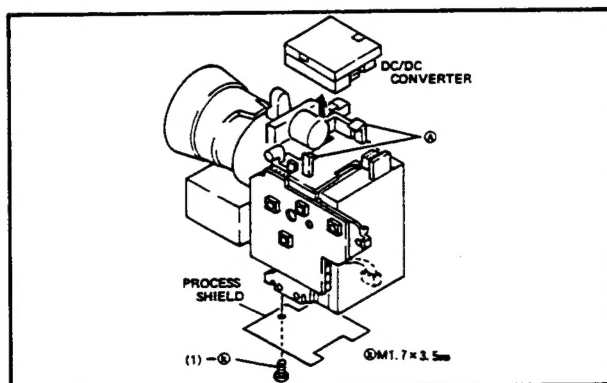


Fig. II-4

1-3 Removal of AF C.B.A.

- (1) Remove a screw (n).
- (2) Unplug connectors between the lens unit and the AF C.B.A. (CN4001, CN4002, CN4003, CN4004, CN4007, CN4008)
- (3) Detach the AF C.B.A.

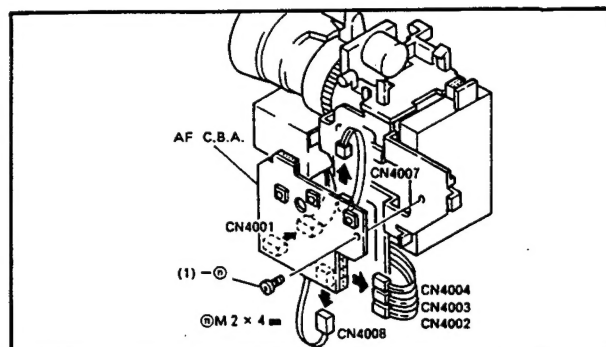


Fig. II-5

1-4 Separation of SENSOR C.B.A., CCD and lens unit

- (1) To detach the shield case 2, unsolder the three parts (A) of the shield case.
- (2) Remove two screws (l) and two screws (m).
- (3) Detach the lens unit.
- (4) Unsolder the pins of CCD.
- (5) To detach the SENSOR C.B.A., remove two screws (j).
- (6) To detach the CCD, remove two screws (l).

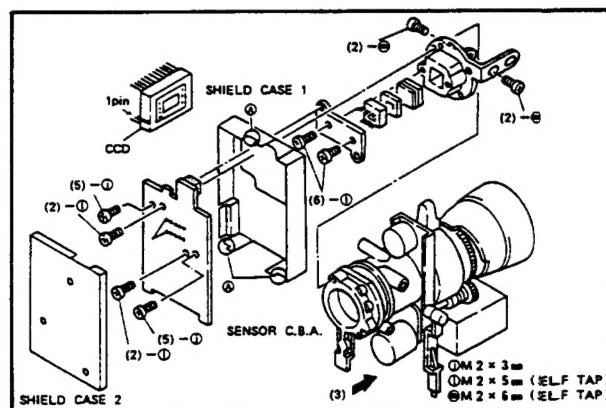


Fig. II-6

1-5 Removal of DC/DC holder

- (1) Remove a screws (j).
- (2) Detach the DC/DC holder.

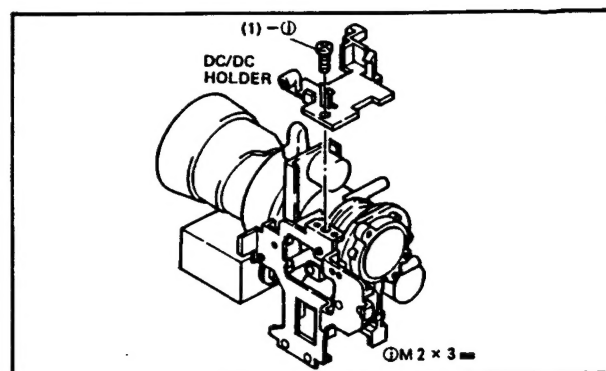


Fig. II-7

2. Disassembling of Lens Section

2-1 Removal of camera holder

- (1) Remove two screws (o).
- (2) Detach the camera holder.

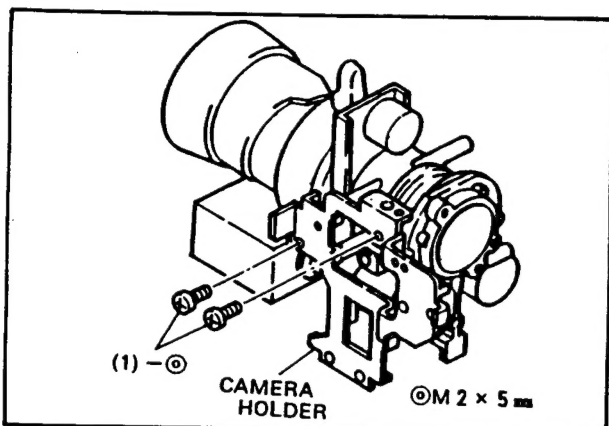


Fig. II-8

2-2 Removal of AF, PZ motors and HOLDER PCB

- (1) Remove a screw (m).
- (2) Detach the HOLDER PCB.
- (3) Remove two screws (p).
- (4) Detach the AF and PZ motors.

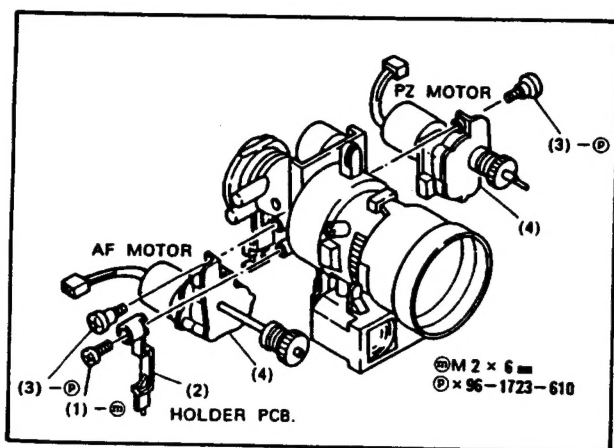


Fig. II-9

2-3 Removal of AF block

- (1) Remove two screws (q).
- (2) Detach the AF block.

- * Notes:
1. When remounting the AF block, make sure that the focusing ring cam surface (A) is interlocked with the prism arm (B) properly.
 2. Do not loosen the screws securing the SPC and IRED C.B.A.s.
 3. After remounting the AF block, be sure to perform the AF distance measuring adjustment (4-2).

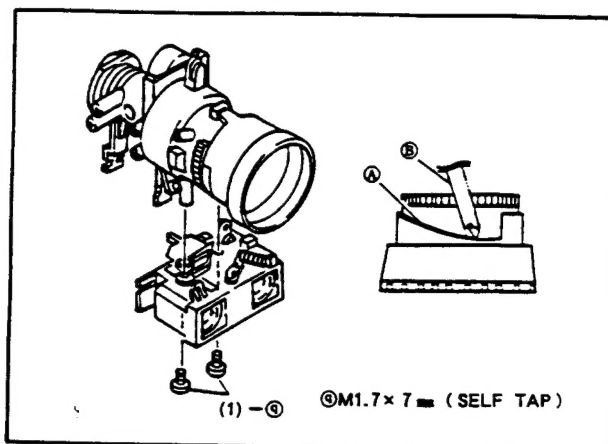


Fig. II-10

2-4 Removal of relay lens assembly

- (1) Remove a screw (r).
- (2) Detach the relay lens assembly.

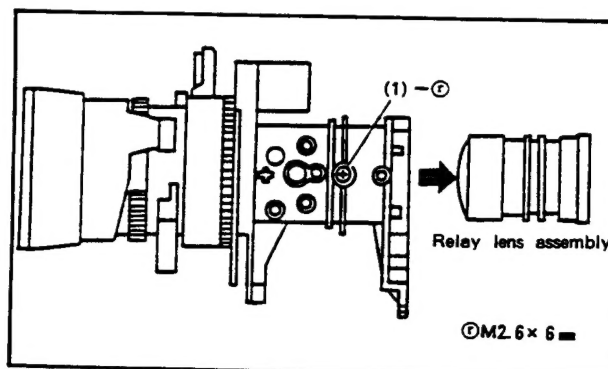


Fig. II-11

2-5 Removal of IG meter assembly

- (1) Detach the IG meter cover.
- (2) Remove a screw (s).
- (3) Detach the IG meter downward.

*Note: When detaching/attaching, be careful not to deform the diaphragm blades. As the diaphragm blades are likely to come off from the dowel, check that they are secured completely.

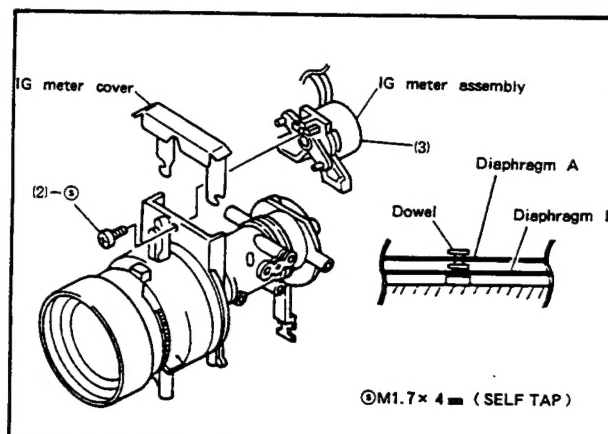


Fig. II-12

2-6 Removal of diaphragm blades A and B

- (1) Remove the IG meter.
- (2) Align the part (a) of diaphragm blade A with its dowel position, and then detach the diaphragm blade A.
- (3) Also, detach the diaphragm blade B in the same manner.

* Notes: 1. Be extremely careful not to bend or contaminate the diaphragm blades. Also, do not touch them with bare hand or fingers.
2. The ND filter is in the blade A.

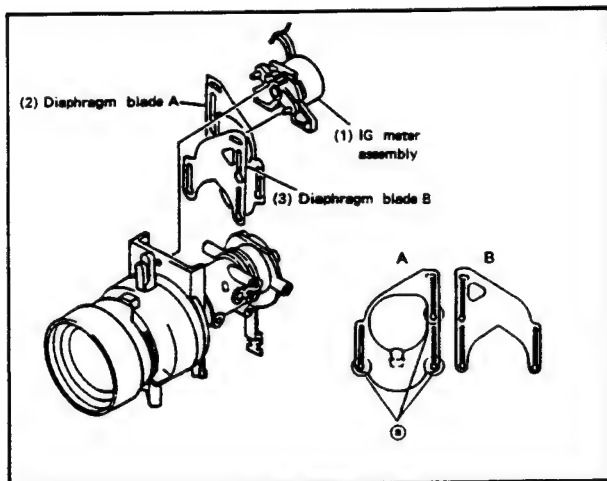


Fig. II-13

2-7 Removal of zoom sheet

- (1) Peel off the zoom sheet with a pair of tweezers or the like.

* Note: When reattaching the zoom sheet, take care not to crease or kink it.

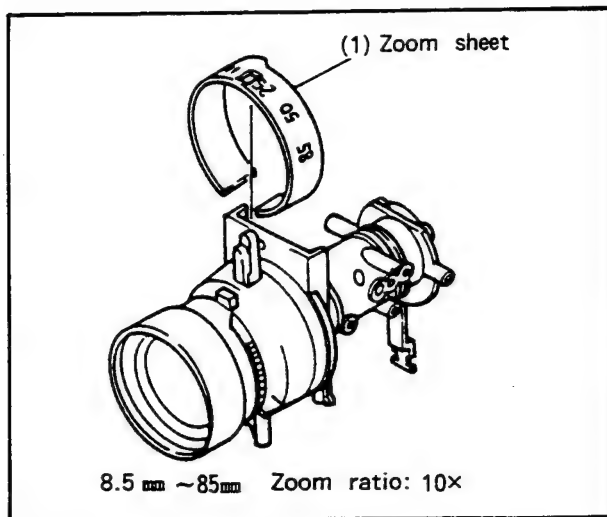


Fig. II-14

2-8 Separation of zoom section

- (1) To detach the N stopper, remove a screw (t).
- (2) Dismount the focus lens assembly.
- (3) Remove three screws (U) with the relay holder (D) and the fixed lens barrel (A) connected.
- (4) Turn the focus side up.
- (5) Set the zoom ring to the telephoto-end position. Then, pull up the fixed lens barrel (A) straight gradually.

* Notes: 1. The cam ring (C) and the zoom ring (B) are detached when the fixed lens barrel (A) is pulled up straight.
2. The three guide bars and a spring are still installed into the relay holder (D) at this state.

- (6) Align the depression of fixed lens barrel (A) and the projection of zoom lever (B) (inside). Then, pull up the fixed lens barrel (A) straight.
- (7) Detach the projection of zoom ring (B) (inside) from the cam ring (C). Then, pull up the zoom ring (B) straight.
- (8) Remove two screws (V).

* Note: When reassembling, check the size of screws.

- (9) Pull up the cam ring (C) straight.

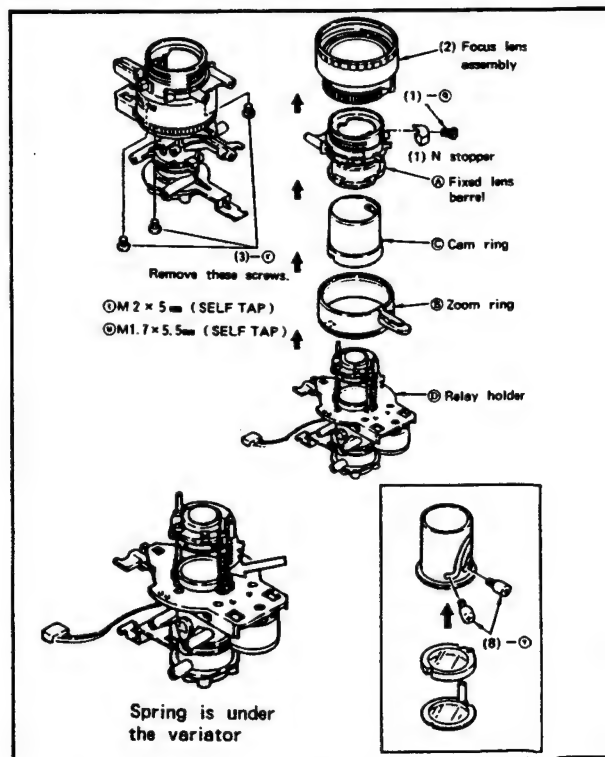


Fig. II-15

2-9 Reassembling of zoom ring

- (1) Install a compensator lens (E) to a relay holder (D), and then a variator lens (F) to it.
- (2) Put the cam ring on the relay holder. Then secure them with two screws (V).
- * Note: Check that the plate springs are positioned properly.
- (3) Install the zoom ring while engaging the claw of zoom ring with the cam ring.
- (4) Mount the fixed lens barrel.
- * Note: When mounting, set the zoom ring at the telephoto-end position. Also, set three zoom bars into the holes of fixed lens barrel completely.
- (5) Secure the relay holder and the fixed lens barrel with three screws (U).
- (6) Mount the focus lens assembly. Then, secure the N stopper with a screw (T).
- (7) Perform the operational checks and the AF distance measuring adjustment.

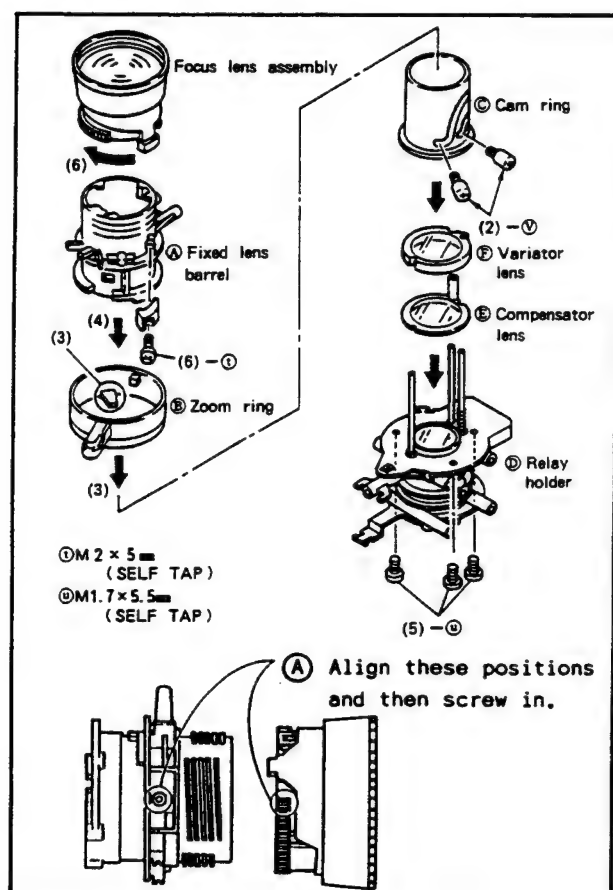


Fig. II-16

2-10 Oil/grease/bond application positions

After cleaning, replacement, etc., apply the followings to the indicted positions in the Fig. II-17.

- ① Grease GE-X8 (CY9-8044-000)
- ② Grease GE-C4 (CY9-8045-000)
- ③ Instantaneous adhesive Alonalpha (CY9-8007-000)
- ④ Floil G902 (DY9-3017-000)
- ⑤ Use the above MP-102 with GE-C4.

Weight ratio is as follows.

MP-102 : GE-C4

3 : 10

Teflon Fluorocarbon Resin MP-102 (DY2-3013-000)

Grease GE-C4 (CY9-8045-000)

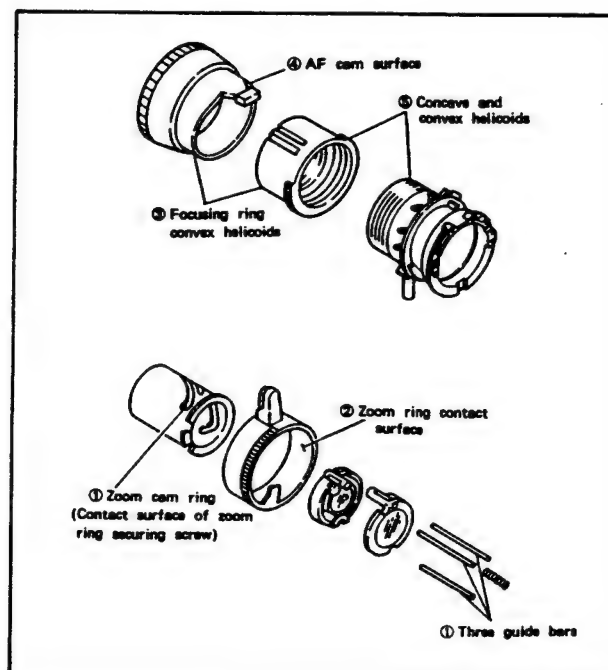


Fig. II-17


CONTENTS

EXPLODED VIEWS

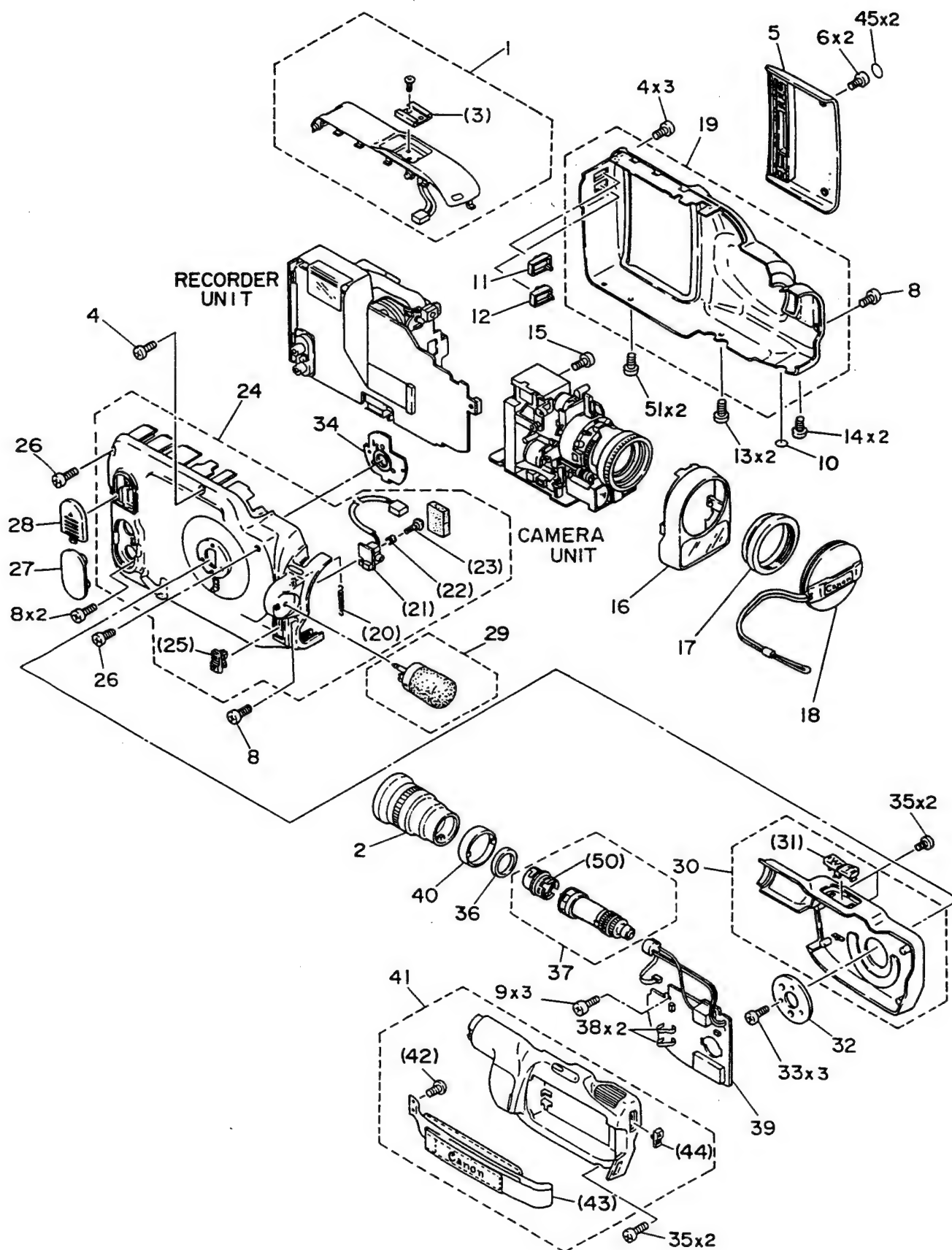
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PARTS LIST	III - 19
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1. ESPECIALLY CRITICAL PARTS IN THE POWER CIRCUIT BLOCK SHOULD NOT BE REPLACED WITH OTHER MARKS.
CRITICAL PARTS ARE MARKED WITH  IN THIS ELECTRICAL PARTS LIST.
2. THE NUMBERS INDICATED ON THE CONNECTORS DO NOT CORRESPOND TO THE SYMBOL NUMBERS.
PLEASE CHECK THE CORRECT SYMBOL NUMBERS OF THE CONNECTORS ON THE INTERCONNECTION SCHEMATIC DIAGRAM.
3. THE NUMBERS INDICATED IN () DENOTE THE QUANTITY FOR E90E, F.
(ONLY IN CASE THE QUANTITY IS NOT SAME AS E57A OR E90E, F)

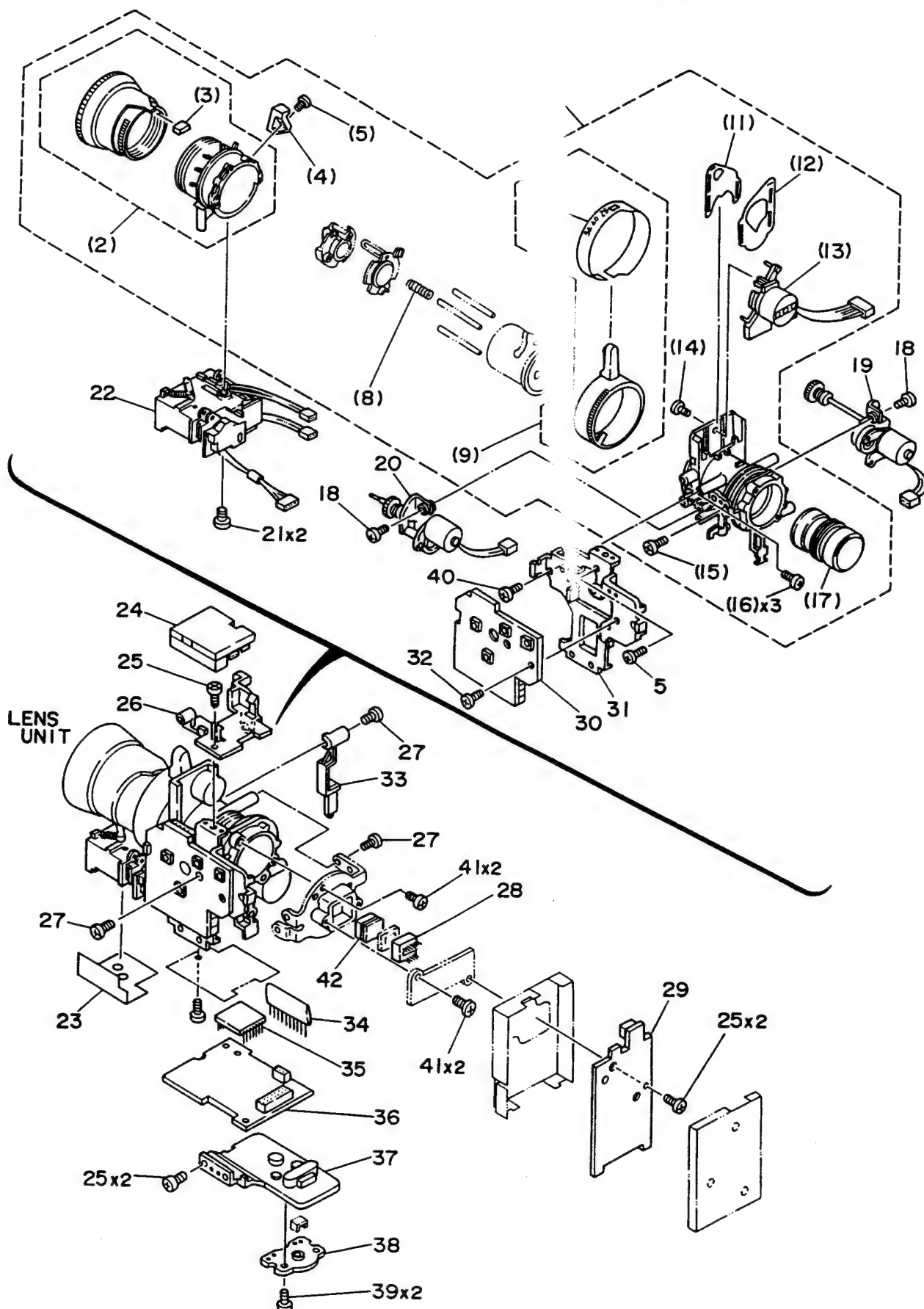
Casing Parts Section



MECHANICAL PARTS

SYMBOL	PART NO.	CLASS	QTY	DESCRIPTION	REMARKS
1	DG1-1839-000 000	B	1	TOP COVER ASS'Y	VCC820 ONLY
2	DA2-1223-000 000	B	1	SPORTS FINDER SF-200	
3	DA1-4403-000 000	B	1	SHOE, ACCESSORY	
4	XA4-7200-459 000	F	4	SCREW, CROSS-RECESS, PH	
5	DF1-0976-000 000	B	1	COVER, CASSETTE	E57A ONLY
	DF1-1119-000 000	B	1	COVER, CASSETTE	VCC820 ONLY
	DF1-0982-000 000	B	1	COVER, CASSETTE	E90F ONLY
6	XAL-7200-359 000	F	2	SCREW, CROSS-RECESS, PH	
8	XAL-6200-509 000	F	4	SCREW, CROSS-RECESS, PH	
9	XA4-9200-409 000	F	3	SCREW, CROSS-RECESS, PH	
10	DA1-4406-000 000	C	1	SEAL, PC	
11	DA1-2793-000 000	B	1	KNOB, EJECT	
12	DA1-4081-000 000	B	1	KNOB, POWER	
13	XAL-7200-409 000	F	2	SCREW, CROSS-RECESS, PH	
14	XAL-6200-759 000	F	2	SCREW, CROSS-RECESS, PH	
15	XAL-7200-407 000	F	1	SCREW, CROSS-RECESS, PH	
16	DG1-1838-000 000	B	1	LENS COVER ASS'Y	VCC820 ONLY
17	DA1-1702-000 000	B	1	HOOD	
18	DF1-0865-000 000	B	1	CAP, LENS	VCC820 ONLY
19	DY2-1299-000 000	B	1	RIGHT COVER ASS'Y	E57A ONLY
	DY1-5013-000 000	B	1	RIGHT COVER ASS'Y	VCC820 ONLY
	DY2-1301-000 000	B	1	RIGHT COVER ASS'Y	E90F ONLY
20	DS1-5185-000 000	C	1	SPRING, COIL	
21	DG1-0895-000 000	C	1	MIC JACK C.B.A.	
22	DA1-1811-000 000	C	1	CUSHION, RUBBER	
23	DA1-1815-000 000	F	1	SCREW, CROSS-RECESS	
24	DY2-1298-000 000	B	1	LEFT COVER ASS'Y	
25	DA1-4427-000 000	B	1	KNOB, GRIP	
26	XA4-7200-609 000	F	2	SCREW, CROSS-RECESS, PH	
27	DA1-4410-000 000	B	1	CAP, AV	
28	DA1-4408-000 000	B	1	COVER, BATTERY	
29	DH9-0548-000 000	C	1	MICROPHONE ASS'Y	VCC820 ONLY
30	DY2-1297-000 000	B	1	RIGHT COVER, GRIP	
31	DA1-2460-000 000	B	1	KNOB, T/W	
32	DA1-2461-000 000	C	1	PLATE	
33	XA9-0503-000 000	F	3	SCREW, CROSS-RECESS, PH	
34	DA1-2600-000 000	C	1	PLATE	
35	XA4-9260-709 000	F	4	SCREW, CROSS-RECESS	
36	DA1-1864-000 000	B	1	RING, RUBBER	
37	DY2-1159-000 000	C	1	CRT ASS'Y	
38	DA1-2463-000 000	C	2	TERMINAL, BATTERY	
39	DG1-1501-000 000	C	1	GRIP C.B.A.	E57A ONLY
	DG1-1510-000 000	C	1	GRIP C.B.A.	E90E,F ONLY
40	DA1-4429-000 000	B	1	RING, E.V.F.	
41	DY2-1296-000 000	B	1	LEFT COVER, GRIP	E57A ONLY
	DG1-1840-000 000	B	1	LEFT COVER, GRIP	VCC820 ONLY
42	XA9-0435-000 000	F	2	SCREW, CROSS-RECESS, PH	
43	DA1-4132-000 000	B	1	STRAP, HAND	VCC820 ONLY
44	DA1-4428-000 000	B	1	KNOB, BATTERY EJECT	
45	DA1-4405-000 000	B	2	SEAL	
50	DA1-2164-000 000	C	1	MASK, CRT	
51	XAL-6200-309 000	F	2	SCREW, CROSS-RECESS, PH	

Lens / Camera it Section



MECHANICAL PARTS

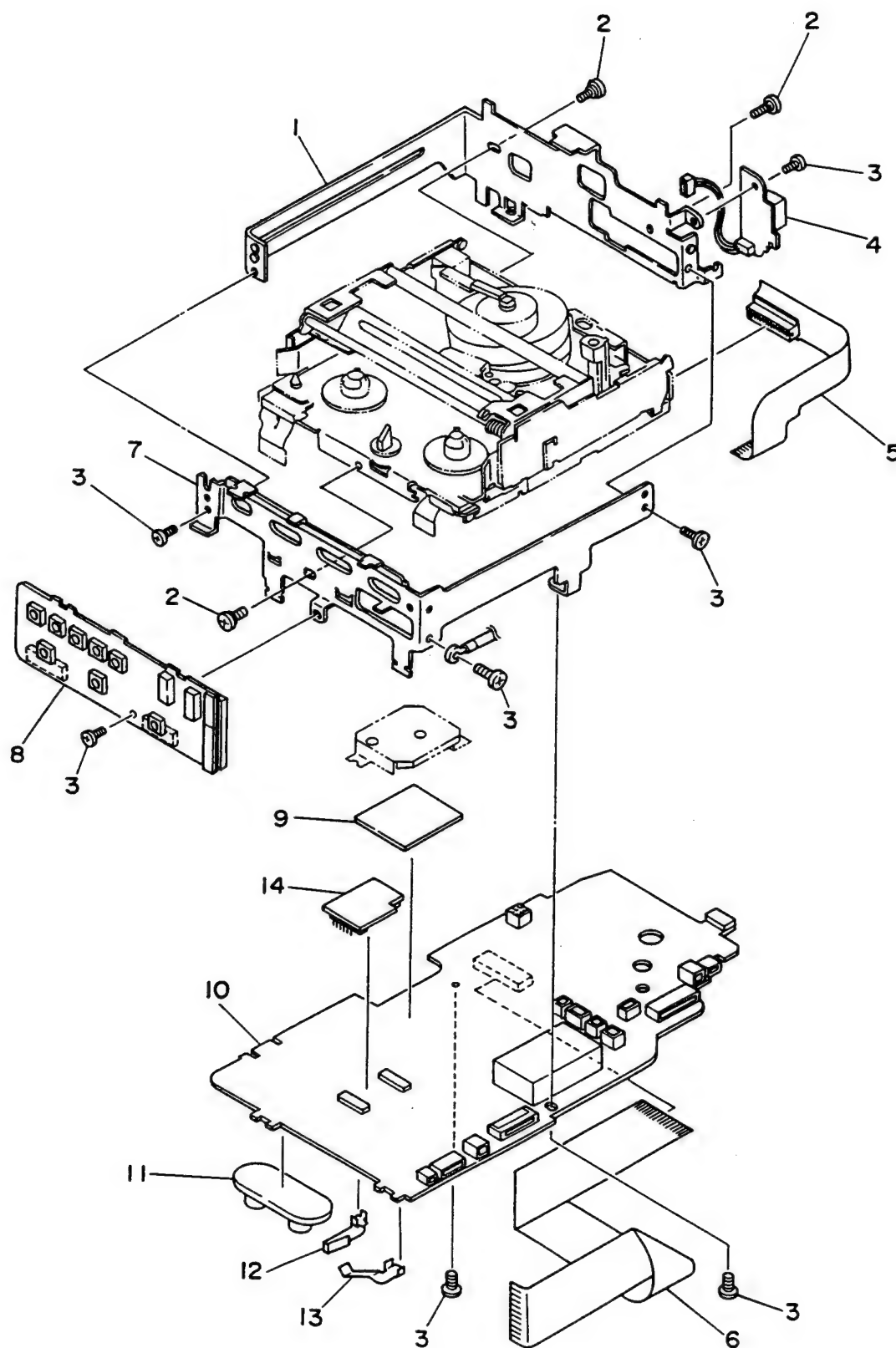
SYMBOL	PART NO.	CLASS	QTY	DESCRIPTION	REMARKS
1	DY1-7138-000	000	C	1	ZOOM LENS ASS'Y
2	DY1-7140-000	000	C	1	FOCUS LENS ASS'Y
3	DA7-1734-000	000	C	1	STOPPER, RUBBER
4	DA7-1724-000	000	C	1	STOPPER, NEARDISTANCE
5	XA4-4200-507	000	F	1	SCREW, CROSS-RECESS, PH
6	XA4-9200-509	000	F	4	SCREW, CROSS-RECESS, PH
7	DH9-0483-000	000	C	1	CRYSTAL FILTER
8	DS1-5198-000	000	C	1	SPRING, COIL
9	DY1-7141-000	000	B	1	ZOOM RING ASS'Y
10	YA1-0205-000	000	B	1	SHEET, ZOOM
11	DA7-1792-000	000	C	1	BLIND, IG METER (B)
12	DF7-0231-000	000	C	1	BLIND, IG METER (A)
13	DH8-0045-000	000	C	1	IG METER
14	XA4-4170-407	000	F	1	SCREW, CROSS-RECESS, PH
15	XB4-6260-607	000	F	1	SCREW M2.6x6
16	XA4-9170-557	000	F	3	SCREW, CROSS-RECESS, PH
17	YG9-5048-000	000	C	1	RELAY LENS ASS'Y
18	X96-1723-610	000	F	2	SCREW, SLOTTED, SHOULDER
19	YG9-5053-000	000	C	1	AF MOTOR ASS'Y
20	YG9-5054-000	000	C	1	PZ MOTOR ASS'Y
21	XA4-2170-707	000	F	2	SCREW, CROSS-RECESS, PH
22	DY1-7139-000	000	C	1	AF BLOCK ASS'Y
23	DA1-2138-000	000	C	1	SHEET
24	DH3-0015-000	000	C	1	DC/DC CONVERTER
25	XA1-7200-307	000	F	5	SCREW, CROSS-RECESS, PH
26	DA1-4085-000	000	C	1	HOLDER, DC/DC
27	XA4-9200-609	000	F	3	SCREW, CROSS-RECESS, PH
28	DH4-0276-000	000	B	1	CCD MN3739FC
	DH4-0277-000	000	B	1	CCD MN3749FC
29	DG1-0949-000	000	C	1	SENSOR C.B.A.
	DG1-1505-000	000	C	1	SENSOR C.B.A.
30	DY1-7142-000	000	C	1	AF C.B.A.
31	YA1-0031-000	000	C	1	HOLDER, CAMERA (A)
32	XA1-6200-407	000	F	1	SCREW, CROSS-RECESS, PH
33	DA1-4077-000	000	C	1	HOLDER, PCB
34	DH4-0247-000	000	C	1	AWB C.B.A.
35	DH4-0246-000	000	C	1	ENCORDER C.B.A.
	DH4-0250-000	000	C	1	ENCORDER C.B.A.
36	DG1-0842-010	000	C	1	PROCESS C.B.A.
	DG1-0844-010	000	C	1	PROCESS C.B.A.
37	DA1-2770-000	000	C	1	HOLDER, CAMERA (B)
38	DA1-2773-000	000	C	1	PLATE, TRIPOD
39	XA4-8260-509	000	F	2	SCREW, CROSS-RECESS, PH
40	XA4-3200-507	000	F	1	SCREW, CROSS-RECESS, PH

E57A ONLY
E90E,F ONLY
E57A ONLY

E90E,F ONLY

E57A ONLY
E90E,F ONLY
E57A ONLY
E90E,F ONLY

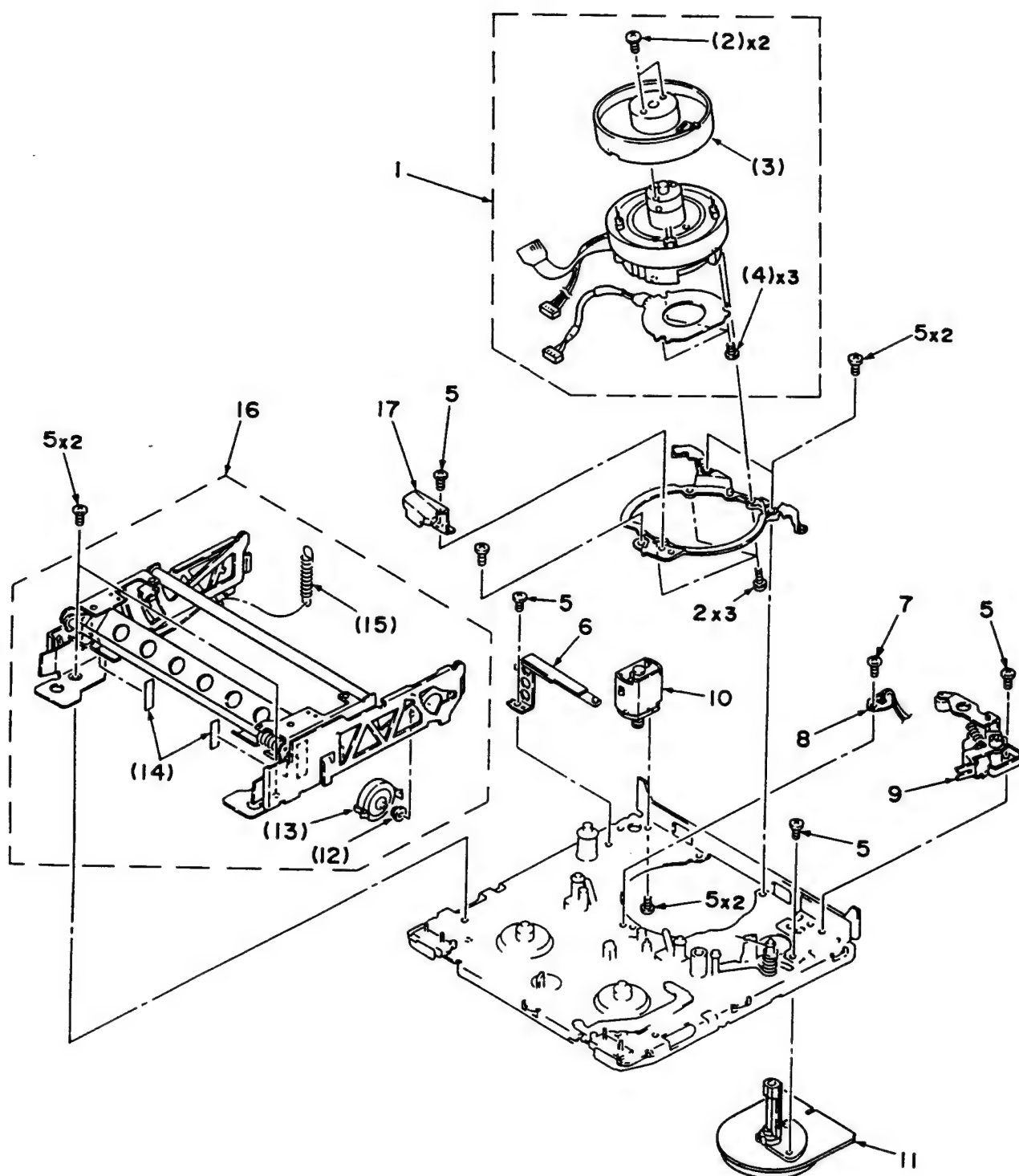
Recorder Unit Section



MECHANICAL PARTS

SYMBOL	PART NO.	CLASS	QTY	DESCRIPTION	REMARKS
1	DA1-2777-000 000	C	1	HOLDER (A), RECORDER	
2	DA1-1948-000 000	F	3	SCREW, CROSS-RECESS	
3	XA1-7200-307 000	F	7	SCREW, CROSS-RECESS, PH	
4	DG1-0894-000 000	C	1	REMOCON C.B.A.	
5	DF1-0562-000 000	C	1	PRINTED CORD	
6	DH2-1098-000 000	C	1	PRINTED CORD	
7	DA1-2778-000 000	C	1	HOLDER (B), RECORDER	
8	DG1-0893-000 000	C	1	RECORDER KEY C.B.A.	E57A ONLY
	DG1-0898-000 000	C	1	RECORDER KEY C.B.A.	E90E,F ONLY
9	DH4-0243-000 000	C	1	HEAD AMP C.B.A.	
10	DG1-1330-000 000	C	1	RECORDER MAIN C.B.A.	E57A ONLY
	DG1-1331-000 000	C	1	RECORDER MAIN C.B.A.	E90E ONLY
	DY2-1218-000 000	C	1	RECORDER MAIN C.B.A.	E90F ONLY
11	DH9-0341-000 000	C	1	PIN JACK ASS'Y	
12	DA1-2796-000 000	C	1	TERMINAL, BATTERY	
13	DA1-2795-000 000	C	1	TERMINAL, BATTERY	
14	DG1-0828-000 000	C	1	JOG C.B.A.	E90E,F ONLY

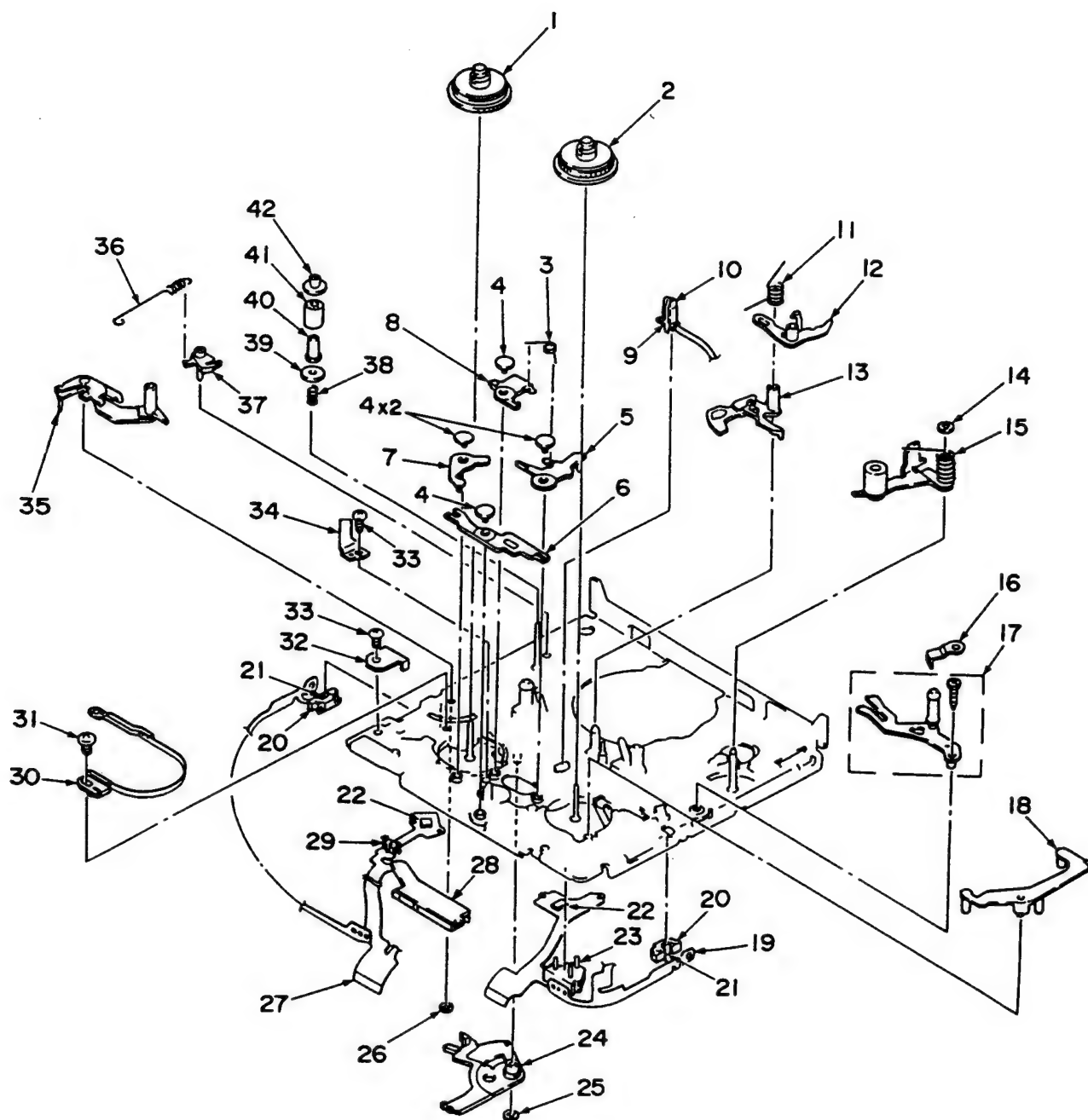
Mechanical Chassis Section I



MECHANICAL PARTS

SYMBOL	PART NO.	CLASS	QTY	DESCRIPTION	REMARKS
1	DY4-4300-000 000	E	1	DRUM ASS'Y	E57A ONLY
	DY4-2732-000 000	E	1	DRUM ASS'Y	E90E,F ONLY
2	DY4-2730-000 000	F	5	SCREW, CROSS-RECESS	
3	DY4-4301-000 000	E	1	UPPER DRUM ASS'Y	E57A ONLY
	DY4-2733-000 000	E	1	UPPER DRUM ASS'Y	E90E,F ONLY
4	DY4-2452-000 000	F	3	SCREW, CROSS-RECESS	
5	DY4-2727-000 000	F	10	SCREW, CROSS-RECESS	
6	DY4-2675-000 000	C	1	TERMINAL, EARTH	
7	DY4-2728-000 000	F	1	SCREW, CROSS-RECESS	
8	Y22-8120-000 000	B	1	SENSOR, DEW	
9	DY4-2652-000 000	C	1	ROLLER ASS'Y	
10	DY4-2651-000 000	C	1	LOADING MOTOR ASS'Y	
11	DY4-2726-000 000	C	1	CAPSTAN MOTOR	
12	DY4-2720-000 000	C	1	DAMPER, OIL	
13	DY4-2709-000 000	C	1	GEAR, DAMPER	
14	DY4-2729-000 000	C	2	TAPE	
15	DY4-2708-000 000	C	1	SPRING, COIL	
16	DY4-2673-000 000	C	1	CASSETTE COMPARTMENT ASS'Y	
17	DY4-2721-000 000	C	1	GUARD, GUIDE	

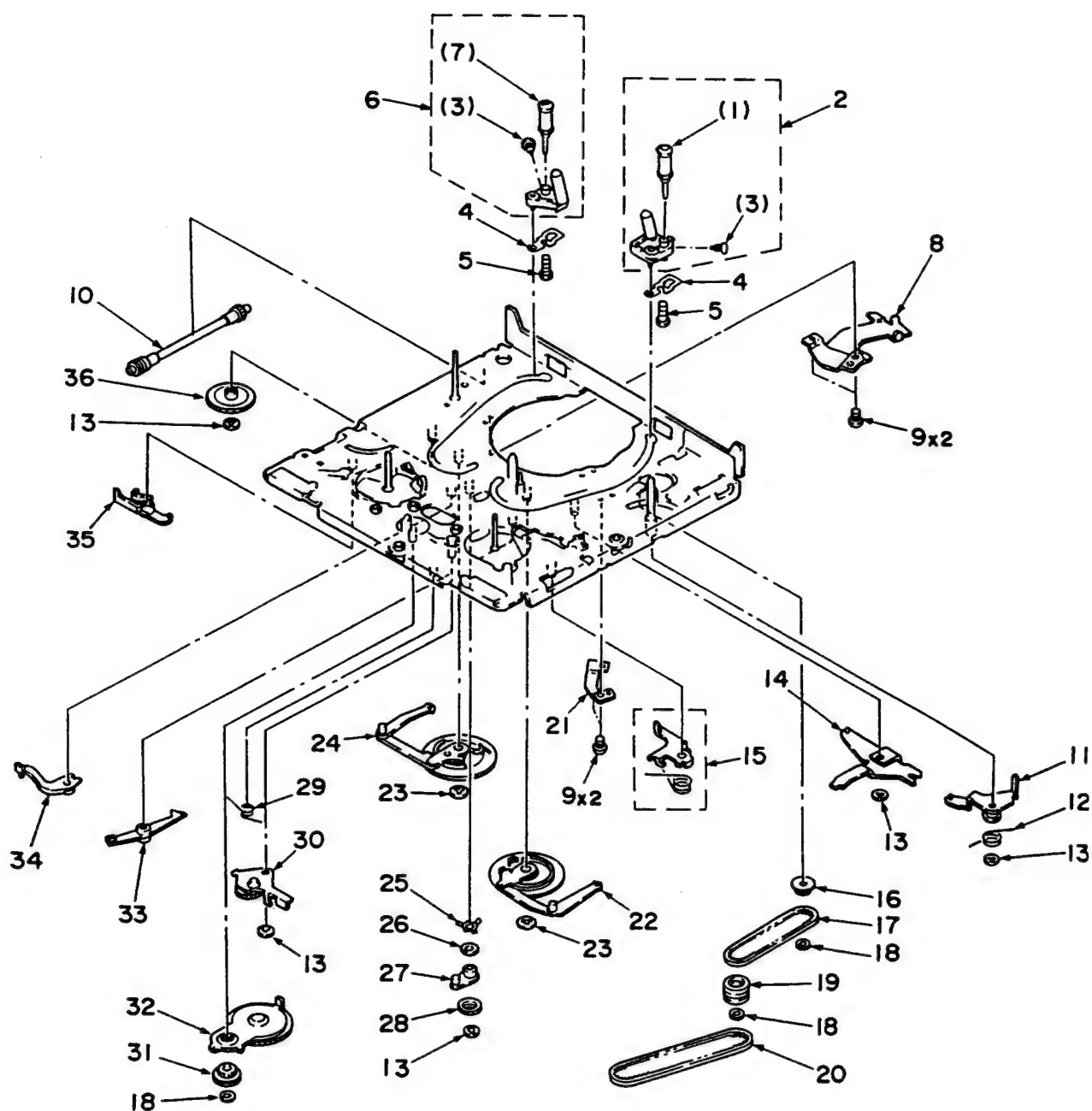
Mechanical Chassis Section 2



MECHANICAL PARTS

SYMBOL	PART NO.	CLASS	QTY	DESCRIPTION	REMARKS
1	DY4-2663-000 000	C	1	REEL, SUPPLY	
2	DY4-2666-000 000	C	1	REEL, TAKE UP	
3	DY4-2699-000 000	C	1	SPRING, COIL	
4	DY4-2696-000 000	C	4	PIN, SHAFT	
5	DY4-2714-000 000	C	1	BRAKE, T	
6	DY4-2692-000 000	C	1	LEVER, LB	
7	DY4-2691-000 000	C	1	BRAKE, LB	
8	DY4-2713-000 000	C	1	BRAKE, S	
9	DY4-2710-000 000	C	1	HOLDER, LED	
10	Y22-8012-000 000	B	1	LED GL452S	
11	DY4-2697-000 000	C	1	SPRING, COIL	
12	DY4-2716-000 000	C	1	ARM, STOPPER	
13	DY4-2723-000 000	C	1	STOPPER, RK	
14	DY4-2440-000 000	F	1	WASHER	
15	DY4-2653-000 000	C	1	ARM, PINCH	
16	DY4-2707-000 000	C	1	SPRING, PLATE	
17	DY4-2664-000 000	C	1	ARM, TG7	
18	DY4-2712-000 000	C	1	ARM RELEASE	
19	DY4-2680-000 000	C	1	FLEXIBLE P.C.B. (2)	
20	DY4-2722-000 000	C	2	HOLDER, SENSOR	
21	Y22-8123-000 000	B	2	PHOTO TRANSISTOR EE-P109	
22	Y22-8121-000 000	B	2	PHOTO IC SPI-315-25-CD	
23	DY4-2678-000 000	C	1	SWITCH, PUSH	
24	DY4-2657-000 000	C	1	LEVER, SWITCH	
25	DY4-2688-000 000	F	1	WASHER	
26	DY4-2681-000 000	F	1	WASHER	
27	DY4-2679-000 000	C	1	FLEXIBLE P.C.B. (1)	
28	DY4-2677-000 000	C	1	SWITCH, SLIDE	
29	DY4-2676-000 000	C	1	SWITCH	
30	DY4-2660-000 000	C	1	BAND, TENSION	
31	DY4-2727-000 000	F	1	SCREW, CROSS-RECESS	
32	DY4-2725-000 000	C	1	PLATE, SWITCH	
33	DY4-2728-000 000	F	2	SCREW, CROSS-RECESS	
34	DY4-2690-000 000	C	1	PLATE, TL	
35	DY4-2669-000 000	C	1	ARM	
36	DY4-2724-000 000	C	1	SPRING, COIL	
37	DY4-2717-000 000	C	1	ARM, ADJUST	
38	DY4-2705-000 000	C	1	SPRING, COIL	
39	DY4-2701-000 000	C	1	FLANGE, TG2	
40	DY4-2704-000 000	C	1	SLEEVE, TG2	
41	DY4-2702-000 000	C	1	ROLLER, TG2	
42	DY4-2703-000 000	C	1	FLANGE, TG2	

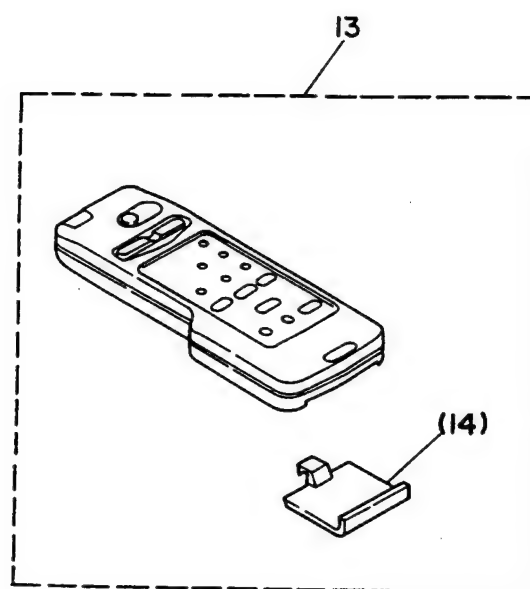
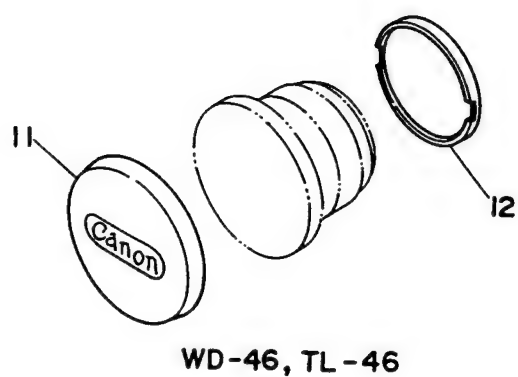
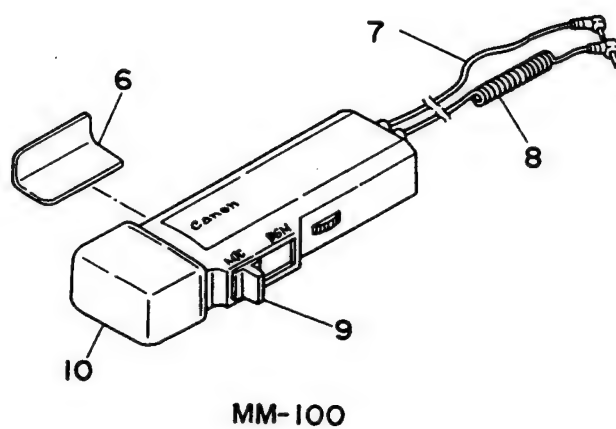
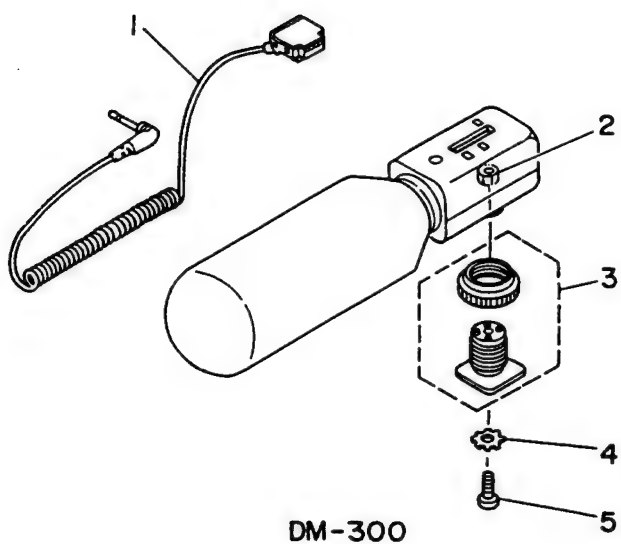
Mechanical Chassis Section 3



MECHANICAL PARTS

SYMBOL	PART NO.	CLASS	QTY	DESCRIPTION	REMARKS
1	DY4-2674-000 000	C	1	ROLLER, GUIDE	
2	DY4-2649-000 000	C	1	COASTER, RIGHT	
3	DY4-2686-000 000	F	2	SCREW, CROSS-RECESS	
4	DY4-2685-000 000	C	2	SPRING, LEAF	
5	DY4-2689-000 000	F	2	SCREW, CROSS-RECESS	
6	DY4-2648-000 000	C	1	COASTER, LEFT	
7	DY4-2662-000 000	C	1	ROLLER, GUIDE	
8	DY4-2672-000 000	C	1	PLATE, SS	
9	DY4-2728-000 000	F	4	SCREW, CROSS-RECESS	
10	DY4-2658-000 000	C	1	WORM ASS'Y	
11	DY4-2665-000 000	C	1	ARM, PINCH SUB	
12	DY4-2706-000 000	C	1	SPRING, COIL	
13	DY4-2688-000 000	F	5	WASHER	
14	DY4-2655-000 000	C	1	LEVER, THREADING	
15	DY4-2659-000 000	C	1	BRAKE, TS	
16	DY4-2656-000 000	C	1	GEAR, JOINT	
17	DY4-2719-000 000	E	1	BELT (S), TIMING	
18	DY4-2681-000 000	F	3	WASHER	
19	DY4-2671-000 000	C	1	PULLY, RELAY	
20	DY4-2718-000 000	E	1	BELT (L), TIMING	
21	DY4-2684-000 000	C	1	PLATE, TT	
22	DY4-2743-000 000	C	1	GEAR	
23	DY4-2440-000 000	F	2	WASHER	
24	DY4-2742-000 000	C	1	GEAR	
25	DY4-2700-000 000	C	1	SPRING	
26	DY4-2527-000 000	F	1	WASHER	
27	DY4-2695-000 000	C	1	ARM, UL	
28	DY4-2694-000 000	C	1	GEAR, UL	
29	DY4-2698-000 000	C	1	SPRING, COIL	
30	DY4-2650-000 000	C	1	GEAR, ASS'Y	
31	DY4-2661-000 000	C	1	GEAR	
32	DY4-2654-000 000	C	1	GEAR, ASS'Y	
33	DY4-2693-000 000	C	1	ARM, RELEASE	
34	DY4-2715-000 000	C	1	BRAKE, UL	
35	DY4-2711-000 000	C	1	LEVER, EJECT	
36	DY4-2687-000 000	C	1	GEAR, WHEEL	

Accessory Parts Section



MECHANICAL PARTS

SYMBOL	PART NO.	CLASS	QTY	DESCRIPTION	REMARKS
1	DY5-1467-000 000	C	1	CORD, BATTERY	
2	DY5-1468-000 000	C	1	NUT	
3	DY5-1469-000 000	C	1	SHOE, ASS'Y	
4	DY5-1470-000 000	C	1	WASHER	
5	DY5-1471-000 000	C	1	SCREW, CROSS-RECESS	
6	DA8-0178-000 000	B	1	COVER, BATTERY	
7	DH2-0812-000 000	C	1	CABLE, INPUT	
8	DH2-0813-000 000	C	1	CABLE, OUTPUT	
9	DA8-0177-000 000	B	1	KNOB, MIXING	
10	DA8-0181-000 000	B	1	WINDSCREEN	
11	DA7-1931-000 000	C	1	CAP, LENS	
12	DA7-1932-000 000	C	1	CAP, DUST	
13	DY1-5005-000 000	B	1	WIRELESS CONTROLLER VWR880	VCC820 ONLY
	DY2-1202-000 000	B	1	WIRELESS CONTROLLER WL-400F	E90F ONLY
14	DY3-4197-000 000	B	1	COVER, BATTERY	

ELECTRICAL PARTS

	SYMBOL	PART NO.	CLASS	QTY	DESCRIPTION	REMARKS
	C609	VC6-4140-475	000	C	1	CAPACITOR, 4.7 μ F 25V
	C610	VC6-5370-336	000	C	1	CAPACITOR, 33 μ F 10V
	C619	VC6-4130-476	000	C	1	CAPACITOR, 47 μ F 16V
	C620	VC5-0700-226	000	C	1	CAPACITOR, 22 μ F 10V
△	C2912	VC5-9850-332	003	C	1	CAPACITOR, 3300pF 100V
△	C2915	VC5-9520-102	000	C	1	CAPACITOR, 1000pF 1KV
△	C2917	VC6-1570-152	200	C	1	CAPACITOR, 1500pF 500V
	CN001	VS1-0875-011	000	C	1	CONNECTOR 11P
	CN002	VS1-0875-013	000	C	1	CONNECTOR 13P
	CN003	VS1-1169-025	000	C	1	CONNECTOR 25P
	CN401	VS1-0875-015	000	C	1	CONNECTOR 15P
	CN601	VS1-0875-025	000	C	1	CONNECTOR 25P
	D101	WA1-0380-000	000	B	1	DIODE MA157
	D102	WA1-0962-000	000	B	1	DIODE MA121
	D105	WA1-1084-000	000	B	1	DIODE MA110
	D109	WA1-0547-000	201	B	1	DIODE 1SS184
	D110	WA1-0604-000	000	B	1	DIODE MA159
	D401	WA1-0612-000	201	B	1	DIODE E10QS03
	D402	WA1-0612-000	201	B	1	DIODE E10QS03
	D403	WA1-1084-000	000	B	1	DIODE MA110
	D404	WA1-1084-000	000	B	1	DIODE MA110
	D405	WA1-1084-000	000	B	1	DIODE MA110
	D601	WA1-1084-000	000	B	1	DIODE MA110
	D602	WA1-1084-000	000	B	1	DIODE MA110
	D603	WA1-1146-000	000	B	1	DIODE MA707
	D604	WA1-0547-000	201	B	1	DIODE 1SS184
	D605	WA1-0696-000	000	B	1	DIODE MA152WA
	D606	WA1-1084-000	000	B	1	DIODE MA110
	D607	WA1-1084-000	000	B	1	DIODE MA110
	D608	WA1-1084-000	000	B	1	DIODE MA110
	D609	WA1-1146-000	000	B	1	DIODE MA707
	D610	WA1-1146-000	000	B	1	DIODE MA707
	D611	WA1-1084-000	000	B	1	DIODE MA110
	D614	WA1-1084-000	000	B	1	DIODE MA110
	D2001	WA1-1084-000	000	B	1	DIODE MA110
	D2002	WA1-5091-000	000	B	1	DIODE 1SV205
	D2051	WA1-0380-000	000	B	1	DIODE MA157
	D2053	WA1-0962-000	000	B	1	DIODE MA121
	D2054	WA1-1084-000	000	B	1	DIODE MA110
	D2201	WA1-1084-000	000	B	1	DIODE MA110
	D2202	WA1-1084-000	000	B	1	DIODE MA110
	D2203	WA1-1084-000	000	B	1	DIODE MA110
	D2204	WA1-1194-000	000	B	1	DIODE MA728
	D2901	WA1-0989-000	000	B	1	DIODE MA3100W
	D2902	WA1-1084-000	000	B	1	DIODE MA110
	D2903	WA1-1084-000	000	B	1	DIODE MA110
	D2904	WA1-1123-000	000	B	1	DIODE AG01Z
△	D2905	WA1-1124-000	000	B	1	DIODE SHV.02
	D2951	WA1-1084-000	000	B	1	DIODE MA110
	D2961	WA1-0384-000	000	B	1	ZENER DIODE RD5.6MB2
	D2971	WA1-1084-000	000	B	1	DIODE MA110
	D2972	WA1-0989-000	000	B	1	DIODE MA3100W
△	FU2931	WD1-0229-000	000	D	1	FUSE 2A 125V
△	FU2971	WD1-5005-000	000	D	1	FUSE 1.6A 125V
	IC102	DH4-0205-000	000	B	1	IC LVC556
	IC103	DH4-0190-000	000	B	1	IC CXA1237AR
	IC104	WA4-0509-000	000	B	1	IC NJM2043M
	IC106	DH4-0180-001	000	B	1	IC CXA1200BQ
	IC107	DH4-0132-000	000	B	1	IC CXL1501M
	IC107	DH4-0139-000	000	B	1	IC CXL1502M

E57A ONLY
E57A ONLYE57A ONLY
E90E,F ONLY

ELECTRICAL PARTS

SYMBOL	PART NO.	CLASS	QTY	DESCRIPTION	REMARKS	
IC108	DH4-0225-000	000	B	1	IC MM33-1002F	
IC401	DH4-0189-000	000	B	1	IC CXA1127M	
IC402	DH4-0029-000	000	B	1	IC CX20114	
IC403	DH4-0030-000	000	B	1	IC CX20115	
IC404	DH4-0135-000	000	B	1	IC CXA1204Q	
IC601	DH4-0237-000	000	B	1	IC CXP80116-523Q	E57A ONLY
IC601	DH4-0235-000	000	B	1	IC CXP80116, 533Q	E90E,F ONLY
IC602	DH4-0240-000	000	B	1	IC μ PD7508G-E97	
IC603	WA4-1231-000	000	B	1	IC LB1631M	
IC604	DH4-0205-000	000	B	1	IC LVC556	
IC605	WA4-1167-000	000	B	1	IC RH5RA50AA	
IC606	WA4-1145-000	000	B	1	IC RH5VA45AA	
IC607	DH4-0236-000	000	B	1	IC MM1019	
IC2001	DH4-0270-000	000	B	1	IC MN5128	
IC2002	DH4-0125-000	000	B	1	IC MN53015CXY	
IC2051	WA3-5362-000	000	B	1	IC MN3107CS	
IC2102	WA4-0901-000	000	B	1	IC AN2011S	
IC2151	WA3-3301-000	000	B	1	IC MN3818S	E57A ONLY
IC2151	WA3-3679-000	000	B	1	IC MN38020S	E90E,F ONLY
IC2201	WA4-0458-000	000	B	1	IC NJM3414M	
IC2202	WA4-0349-000	201	B	1	IC NJM2904M	
IC2203	DH4-0228-000	000	B	1	IC AN2154FAP	
IC2901	WA4-1322-000	000	B	1	IC AN2514S	
IC2931	DH4-0205-000	000	B	1	IC LVC556	
IC2941	DH4-0155-000	000	B	1	IC μ PD6145G-101	
IC2971	WA4-0349-000	201	B	1	IC NJM2904M	
L2902	DH9-0459-000	000	D	1	COIL 184 μ H	
Q106	WA2-1436-000	000	B	1	TRANSISTOR 2SB962-Z	
Q107	WA2-0735-000	201	B	1	TRANSISTOR 2SC2712	
Q108	WA2-0735-000	201	B	1	TRANSISTOR 2SC2712	
Q109	WA2-0735-000	201	B	1	TRANSISTOR 2SC2712	
Q110	WA2-0646-000	000	B	1	TRANSISTOR 2SD1328	
Q111	WA2-1498-000	000	B	1	TRANSISTOR 2SA1162	
Q112	WA2-0735-000	201	B	1	TRANSISTOR 2SC2712	
Q113	WA2-1234-000	000	B	1	TRANSISTOR IMX2	
Q114	WA2-1230-000	000	B	1	TRANSISTOR IMH6	E90E,F ONLY
Q115	WA2-0735-000	201	B	1	TRANSISTOR 2SC2712	
Q116	WA2-0735-000	201	B	1	TRANSISTOR 2SC2712	
Q117	WA2-1498-000	000	B	1	TRANSISTOR 2SA1162	
Q118	WA2-1498-000	000	B	1	TRANSISTOR 2SA1162	
Q119	WA2-0735-000	201	B	1	TRANSISTOR 2SC2712	
Q120	WA2-0735-000	201	B	1	TRANSISTOR 2SC2712	
Q121	WA2-0735-000	201	B	1	TRANSISTOR 2SC2712	
Q124	WA2-0735-000	201	B	1	TRANSISTOR 2SC2712	
Q125	WA2-1230-000	000	B	1	TRANSISTOR IMH6	
Q126	WA2-0884-000	000	B	1	TRANSISTOR DTC144EK	
Q127	WA2-1230-000	000	B	1	TRANSISTOR IMH6	E90E,F ONLY
Q128	WA2-0884-000	000	B	1	TRANSISTOR DTC144EK	
Q129	WA2-0884-000	000	B	1	TRANSISTOR DTC144EK	
Q130	WA2-1498-000	000	B	1	TRANSISTOR 2SA1162	
Q131	WA2-0735-000	201	B	1	TRANSISTOR 2SC2712	
Q132	WA2-1298-000	000	B	1	TRANSISTOR DTC124TK	
Q133	WA2-1234-000	000	B	1	TRANSISTOR IMX2	
Q134	WA2-1234-000	000	B	1	TRANSISTOR IMX2	
Q135	WA2-1496-000	000	B	1	TRANSISTOR IMB8	
Q136	WA2-1234-000	000	B	1	TRANSISTOR IMX2	
Q137	WA2-1230-000	000	B	1	TRANSISTOR IMH6	
Q138	WA2-0759-000	000	B	1	TRANSISTOR DTA144EK	
Q139	WA2-1386-000	000	B	1	TRANSISTOR DTA144EK	E57A ONLY
Q401	WA2-0797-000	201	B	1	TRANSISTOR 2SA1213	

ELECTRICAL PARTS

SYMBOL	PART NO.	CLASS	QTY	DESCRIPTION	REMARKS
Q402	WA2-0797-000	201	B	1	TRANSISTOR 2SA1213
Q403	WA2-1498-000	000	B	1	TRANSISTOR 2SA1162
Q404	WA2-1198-000	000	B	1	TRANSISTOR IMD2
Q405	WA2-1368-000	000	B	1	TRANSISTOR DTC114EK
Q406	WA2-1368-000	000	B	1	TRANSISTOR DTC114EK
Q407	WA2-0759-000	000	B	1	TRANSISTOR DTA144EK
Q601	WA2-0759-000	000	B	1	TRANSISTOR DTA144EK
Q602	WA2-0884-000	000	B	1	TRANSISTOR DTC144EK
Q603	WA2-0735-000	201	B	1	TRANSISTOR 2SC2712
Q604	WA2-0759-000	000	B	1	TRANSISTOR DTA144EK
Q605	WA2-1121-000	000	B	1	TRANSISTOR DTC143EK
Q606	WA2-0760-000	000	B	1	TRANSISTOR DTC114TK
Q607	WA2-0884-000	000	B	1	TRANSISTOR DTC144EK
Q608	WA2-0797-000	201	B	1	TRANSISTOR 2SA1213
Q609	WA2-0884-000	000	B	1	TRANSISTOR DTC144EK
Q2002	WA2-1501-000	000	B	1	FET 2SK198
Q2051	WA2-1234-000	000	B	1	TRANSISTOR IMX2
Q2052	WA2-1172-000	000	B	1	TRANSISTOR 2SA1461
Q2053	WA2-0052-000	000	B	1	TRANSISTOR 2SC1621
Q2054	WA2-1172-000	000	B	1	TRANSISTOR 2SA1461
Q2055	WA2-0052-000	000	B	1	TRANSISTOR 2SC1621
Q2056	WA2-1172-000	000	B	1	TRANSISTOR 2SA1461
Q2057	WA2-0052-000	000	B	1	TRANSISTOR 2SC1621
Q2101	WA2-0735-000	201	B	1	TRANSISTOR 2SC2712
Q2102	WA2-0735-000	201	B	1	TRANSISTOR 2SC2712
Q2103	WA2-0735-000	201	B	1	TRANSISTOR 2SC2712
Q2151	WA2-1234-000	000	B	1	TRANSISTOR IMX2
Q2201	WA2-1228-000	000	B	1	TRANSISTOR IMT2
Q2202	WA2-1234-000	000	B	1	TRANSISTOR IMX2
Q2203	WA2-0735-000	201	B	1	TRANSISTOR 2SC2712
Q2204	WA2-1498-000	000	B	1	TRANSISTOR 2SA1162
Q2205	WA2-1232-000	000	B	1	TRANSISTOR IMZ1
Q2206	WA2-1498-000	000	B	1	TRANSISTOR 2SA1162
Q2207	WA2-1234-000	000	B	1	TRANSISTOR IMX2
Q2208	WA2-1232-000	000	B	1	TRANSISTOR IMZ1
Q2209	WA2-1232-000	000	B	1	TRANSISTOR IMZ1
Q2210	WA2-1228-000	000	B	1	TRANSISTOR IMT2
Q2211	WA2-1256-000	000	B	1	TRANSISTOR IMH5
Q2212	WA2-1232-000	000	B	1	TRANSISTOR IMZ1
Q2213	WA2-1232-000	000	B	1	TRANSISTOR IMZ1
Q2214	WA2-1234-000	000	B	1	TRANSISTOR IMX2
Q2401	WA2-1234-000	000	B	1	TRANSISTOR IMX2
Q2402	WA2-1234-000	000	B	1	TRANSISTOR IMX2
Q2403	WA2-1228-000	000	B	1	TRANSISTOR IMT2
Q2404	WA2-0884-000	000	B	1	TRANSISTOR DTC144EK
Q2405	WA2-1234-000	000	B	1	TRANSISTOR IMX2
Q2410	WA2-1498-000	000	B	1	TRANSISTOR 2SA1162
Q2411	WA2-1232-000	000	B	1	TRANSISTOR IMZ1
Q2412	WA2-1234-000	000	B	1	TRANSISTOR IMX2
Q2901	WA2-0839-000	000	B	1	TRANSISTOR 2SA1226
Q2902	WA2-1498-000	000	B	1	TRANSISTOR 2SA1162
Q2903	WA2-0393-000	201	B	1	TRANSISTOR 2SA1162
Q2904	WA2-5151-000	000	B	1	TRANSISTOR 2SD968A-S
Q2931	WA2-0797-000	201	B	1	TRANSISTOR 2SA1213
Q2951	WA2-0393-000	201	B	1	TRANSISTOR 2SA1162
Q2952	WA2-0735-000	201	B	1	TRANSISTOR 2SC2712
Q2953	WA2-0735-000	201	B	1	TRANSISTOR 2SC2712
Q2971	WA2-5222-000	000	B	1	FET 2SK1468
Q2972	WA2-5221-000	000	B	1	TRANSISTOR 2SD1757
Q2973	WA2-1378-000	000	B	1	TRANSISTOR DTC144EU

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ELECTRICAL PARTS

SYMBOL	PART NO.	CLASS	QTY	DESCRIPTION	REMARKS	
△	RR601	DH4-0144-000	000	D 1	LINK IC ICP-F25	
△	RR2931	DH4-0144-000	000	D 1	LINK IC ICP-F25	
△	RR2932	DH4-0142-000	000	D 1	LINK IC ICP-F15	
△	RR2933	DH4-0142-000	000	D 1	LINK IC ICP-F15	
△	RR2934	DH4-0166-000	000	D 1	LINK IC D2000	E90E,F ONLY
△	RR2971	WD8-5005-000	000	D 1	LINK IC D1600	E90E,F ONLY
	SW2971	DH9-0516-000	000	1	SWITCH	
△	T2901	DH9-0456-000	000	D 1	FLYBACK, TRANSFORMER	
	VC601	VC6-0340-300	000	C 1	CAPACITOR, TRIMMER 30pF	
	VC2001	VC6-0340-100	000	C 1	CAPACITOR, TRIMMER 10pF	
	VC2002	VC6-0340-100	000	C 1	CAPACITOR, TRIMMER 10pF	
	VC2401	VC6-0340-300	000	C 1	CAPACITOR, TRIMMER 30pF	
	VC2941	VC5-9700-300	000	C 1	CAPACITOR, TRIMMER 30pF	
	VR101	VR5-7780-103	000	C 1	RESISTOR, VARIABLE 10KΩ	
	VR102	VR5-7780-472	000	C 1	RESISTOR, VARIABLE 4.7KΩ	E57A ONLY
	VR102	VR5-7780-103	000	C 1	RESISTOR, VARIABLE 10KΩ	E90E,F ONLY
	VR103	VR5-7780-223	000	C 1	RESISTOR, VARIABLE 22KΩ	
	VR104	VR5-7780-103	000	C 1	RESISTOR, VARIABLE 10KΩ	
	VR105	VR5-7780-222	000	C 1	RESISTOR, VARIABLE 2.2KΩ	
	VR106	VR5-7780-222	000	C 1	RESISTOR, VARIABLE 2.2KΩ	
	VR107	VR5-7780-103	000	C 1	RESISTOR, VARIABLE 10KΩ	
	VR108	VR5-7780-222	000	C 1	RESISTOR, VARIABLE 2.2KΩ	
	VR109	VR5-7780-332	000	C 1	RESISTOR, VARIABLE 3.3KΩ	
	VR110	VR5-7780-472	000	C 1	RESISTOR, VARIABLE 4.7KΩ	
	VR111	VR5-7780-223	000	C 1	RESISTOR, VARIABLE 22KΩ	
	VR112	VR5-7780-102	000	C 1	RESISTOR, VARIABLE 1KΩ	
	VR113	VR5-7780-223	000	C 1	RESISTOR, VARIABLE 22KΩ	E90E,F ONLY
	VR401	VR5-7780-103	000	C 1	RESISTOR, VARIABLE 10KΩ	
	VR602	VR5-7780-104	000	C 1	RESISTOR, VARIABLE 100KΩ	
	VR603	VR5-7780-103	000	C 1	RESISTOR, VARIABLE 10KΩ	
	VR2101	VR7-0520-103	000	C 1	RESISTOR, VARIABLE 10KΩ	E57A ONLY
	VR2101	VR5-7780-103	000	C 1	RESISTOR, VARIABLE 10KΩ	E90E,F ONLY
	VR2201	VR7-0520-472	000	C 1	RESISTOR, VARIABLE 4.7KΩ	
	VR2202	VR7-0520-103	000	C 1	RESISTOR, VARIABLE 10KΩ	
	VR2203	VR7-0520-103	000	C 1	RESISTOR, VARIABLE 10KΩ	
	VR2204	VR7-0520-103	000	C 1	RESISTOR, VARIABLE 10KΩ	
	VR2205	VR7-0520-103	000	C 1	RESISTOR, VARIABLE 10KΩ	
	VR2206	VR7-0520-103	000	C 1	RESISTOR, VARIABLE 10KΩ	
	VR2207	VR7-0520-472	000	C 1	RESISTOR, VARIABLE 4.7KΩ	
	VR2401	VR7-0520-472	000	C 1	RESISTOR, VARIABLE 4.7KΩ	
	VR2402	VR7-0520-472	000	C 1	RESISTOR, VARIABLE 4.7KΩ	
	VR2403	VR7-0520-103	000	C 1	RESISTOR, VARIABLE 10KΩ	
	VR2404	VR7-0520-103	000	C 1	RESISTOR, VARIABLE 10KΩ	
	VR2405	VR7-0520-103	000	C 1	RESISTOR, VARIABLE 10KΩ	
	VR2651	VR7-0520-472	000	C 1	RESISTOR, VARIABLE 4.7KΩ	
	VR2652	VR7-0520-472	000	C 1	RESISTOR, VARIABLE 4.7KΩ	
	VR2653	VR7-0520-472	000	C 1	RESISTOR, VARIABLE 4.7KΩ	
	VR2654	VR7-0520-472	000	C 1	RESISTOR, VARIABLE 4.7KΩ	
	VR2901	VR5-7680-201	000	C 1	RESISTOR, VARIABLE 200Ω	
	VR2902	VR5-7680-503	000	C 1	RESISTOR, VARIABLE 50KΩ	
△	VR2903	VR5-4640-205	000	C 1	RESISTOR, VARIABLE 2MΩ	
	VR2904	VR5-4640-504	000	C 1	RESISTOR, VARIABLE 500KΩ	
	VR2961	VR5-7680-503	000	C 1	RESISTOR, VARIABLE 50KΩ	

PARTS LIST

PAGE	PART NO.	CLASS	QTY	DESCRIPTION	REMARKS	
2	DA1-1702-000	000	B	1	HOOD	
2	DA1-1811-000	000	C	1	CUSHION, RUBBER	
2	DA1-1815-000	000	F	1	SCREW, CROSS-RECESS	
2	DA1-1864-000	000	B	1	RING, RUBBER	
6	DA1-1948-000	000	C	3	SCREW, CROSS-RECESS	
4	DA1-2138-000	000	C	1	SHEET	
2	DA1-2164-000	000	C	1	MASK, CRT	
2	DA1-2460-000	000	B	1	KNOB, T/W	
2	DA1-2461-000	000	C	1	PLATE	
2	DA1-2463-000	000	C	2	TERMINAL, BATTERY	
2	DA1-2600-000	000	C	1	PLATE	
4	DA1-2770-000	000	C	1	HOLDER, CAMERA (B)	
4	DA1-2773-000	000	C	1	PLATE, TRIPOD	
6	DA1-2777-000	000	C	1	HOLDER (A), RECORDER	
6	DA1-2778-000	000	C	1	HOLDER (B), RECORDER	
2	DA1-2793-000	000	B	1	KNOB, EJECT	
6	DA1-2795-000	000	C	1	TERMINAL, BATTERY	
6	DA1-2796-000	000	C	1	TERMINAL, BATTERY	
2	DA1-4132-000	000	B	1	STRAP, HAND	VCC820 ONLY
4	DA1-4077-000	000	C	1	HOLDER, PCB	
2	DA1-4081-000	000	B	1	KNOB, POWER	
4	DA1-4085-000	000	C	1	HOLDER, DC/DC	
2	DA1-4403-000	000	B	1	SHOE, ACCESORY	
2	DA1-4405-000	000	B	2	SEAL	
2	DA1-4406-000	000	C	1	SEAL, PC	
2	DA1-4408-000	000	B	1	COVER, BATTERY	
2	DA1-4410-000	000	B	1	CAP, AV	
2	DA1-4427-000	000	B	1	KNOB, GRIP	
2	DA1-4428-000	000	B	1	KNOB, BATTERY EJECT	
2	DA1-4429-000	000	B	1	RING, E.V.F.	
4	DA7-1724-000	000	C	1	STOPPER, NEARDISTANCE	
4	DA7-1734-000	000	C	1	STOPPER, RUBBER	
4	DA7-1792-000	000	C	1	BLIND, IG METER (B)	
14	DA7-1931-000	000	C	1	CAP, LENS	
14	DA7-1932-000	000	C	1	CAP, DUST	
14	DA8-0177-000	000	B	1	KNOB, MIXING	
14	DA8-0178-000	000	B	1	COVER, BATTERY	
14	DA8-0181-000	000	B	1	WINDSCREEN	
2	DF1-0865-000	000	B	1	CAP, LENS	VCC820 ONLY
6	DF1-0562-000	000	C	1	PRINTED CORD	
2	DF1-0976-000	000	B	1	COVER, CASSETTE	E57A ONLY
2	DF1-1119-000	000	B	1	COVER, CASSETTE	VCC820 ONLY
2	DF1-0982-000	000	B	1	COVER, CASSETTE	E90F ONLY
4	DF7-0231-000	000	C	1	BLIND, IG METER (A)	
6	DG1-0828-000	000	C	1	JOG C.B.A.	E90E,F ONLY
4	DG1-0842-010	000	C	1	PROCESS C.B.A.	E57A ONLY
4	DG1-0844-010	000	C	1	PROCESS C.B.A.	E90E,F ONLY
6	DG1-0893-000	000	C	1	RECORDER KEY C.B.A.	E57A ONLY
6	DG1-0894-000	000	C	1	REMOCON C.B.A.	
2	DG1-0895-000	000	C	1	MIC JACK C.B.A.	
6	DG1-0898-000	000	C	1	RECORDER KEY C.B.A.	E90E,F ONLY
4	DG1-0949-000	000	C	1	SENSOR C.B.A.	E57A ONLY
6	DG1-1330-000	000	C	1	RECORDER MAIN C.B.A.	E57A ONLY
6	DG1-1331-000	000	C	1	RECORDER MAIN C.B.A.	E90E ONLY
2	DG1-1501-000	000	D	1	GRIP C.B.A.	E57A ONLY
2	DG1-1838-000	000	B	1	LENS COVER ASS'Y	VCC820 ONLY
2	DG1-1839-000	000	B	1	TOP COVER ASS'Y	VCC820 ONLY
4	DG1-1505-000	000	C	1	SENSOR C.B.A.	E90E,F ONLY
2	DG1-1840-000	000	B	1	LEFT COVER, GRIP	VCC820 ONLY
2	DG1-1510-000	000	C	1	GRIP C.B.A.	E90E,F ONLY

PARTS LIST

PAGE	PART NO.	CLASS	QTY	DESCRIPTION	REMARKS
14	DH2-0812-000 000	C	1	CABLE, INPUT	
14	DH2-0813-000 000	C	1	CABLE, OUTPUT	
6	DH2-1098-000 000	C	1	PRINTED CORD	
4	DH3-0015-000 000	C	1	DC/DC CONVERTER	
	DH4-0029-000 000	B	1	IC CX20114	
	DH4-0030-000 000	B	1	IC CX20115	
	DH4-0125-000 000	B	1	IC MN53015CXY	
	DH4-0132-000 000	B	1	IC CXL1501M	E57A ONLY
	DH4-0135-000 000	B	1	IC CXA1204Q	
	DH4-0139-000 000	B	1	IC CXL1502M	E90E,F ONLY
△	DH4-0142-000 000	D	3	LINK, IC ICP-F15	
△	DH4-0144-000 000	D	2	LINK, IC ICP-F25	
	DH4-0155-000 000	B	1	IC μ PD6145G-101	
△	DH4-0166-000 000	D	1	LINK IC D2000	E90E,F ONLY
	DH4-0180-001 000	B	1	IC CXA1200BQ	
	DH4-0189-000 000	B	1	IC CXA1127M	
	DH4-0190-000 000	B	1	IC CXA1237AR	
	DH4-0205-000 000	B	3	IC LVC556	
	DH4-0225-000 000	B	1	IC MM33-1002F	
	DH4-0228-000 000	B	1	IC AN2154FAP	
	DH4-0235-000 000	B	1	IC CXP80116-533Q	E90E,F ONLY
	DH4-0236-000 000	B	1	IC MM1019	
	DH4-0237-000 000	B	1	IC CXP80116-523Q	E57A ONLY
	DH4-0240-000 000	B	1	IC μ PD7508G-E97	
6	DH4-0243-000 000	C	1	HEAD AMP C.B.A.	
4	DH4-0246-000 000	C	1	ENCORDER C.B.A.	E57A ONLY
4	DH4-0247-000 000	C	1	AWB C.B.A.	
4	DH4-0250-000 000	C	1	ENCORDER C.B.A.	E90E,F ONLY
	DH4-0270-000 000	B	1	IC MN5128	
4	DH4-0276-000 000	B	1	CCD MN3739FC	E57A ONLY
4	DH4-0277-000 000	B	1	CCD MN3749FC	E90E,F ONLY
4	DH8-0045-000 000	C	1	IG METER	
6	DH9-0341-000 000	C	1	PIN JACK ASS'Y	
	DH9-0456-000 000	D	1	FLYBACK, TRANSFORMER	
△	DH9-0459-000 000	C	1	COIL 184 μ H	
4	DH9-0483-000 000	C	1	CRYSTAL FILTER	
	DH9-0516-000 000		1	SWITCH	
	DH9-0548-000 000	C	1	MICROPHONE ASS'Y	VCC820 ONLY
2	DS1-5185-000 000	C	1	SPRING, COIL	
4	DS1-5198-000 000	C	1	SPRING, COIL	
4	DY1-7138-000 000	C	1	ZOOM LENS ASS'Y	
4	DY1-7139-000 000	C	1	AF BLOCK ASS'Y	
4	DY1-7140-000 000	C	1	FOCUS LENS ASS'Y	
4	DY1-7141-000 000	B	1	ZOOM RING ASS'Y	
4	DY1-7142-000 000	C	1	AF C.B.A.	
△	DY2-1159-000 000	C	1	CRT ASS'Y	
14	DY1-5005-000 000	B	1	WIRELESS CONTROLLER VWR880	VCC820 ONLY
14	DY2-1202-000 000	B	1	WIRELESS CONTROLLER WL-400F	E90F ONLY
6	DY2-1218-000 000	C	1	RECORDER MAIN C.B.A.	E90F ONLY
2	DY2-1223-000 000	B	1	SPORTS FINDER SF-200	
2	DY2-1296-000 000	B	1	LEFT COVER, GRIP	E57A ONLY
2	DY2-1297-000 000	B	1	RIGHT COVER, GRIP	
2	DY2-1298-000 000	B	1	LEFT COVER ASS'Y	
2	DY2-1299-000 000	B	1	RIGHT COVER ASS'Y	E57A ONLY
2	DY1-5013-000 000	B	1	RIGHT COVER ASS'Y	VCC820 ONLY
2	DY2-1301-000 000	B	1	RIGHT COVER ASS'Y	E90F ONLY

PARTS LIST

PAGE	PART NO.	CLASS	QTY	DESCRIPTION	REMARKS
14	DY3-4197-000 000	B	1	COVER, BATTERY	
10,12	DY4-2440-000 000	F	3	WASHER	
8	DY4-2452-000 000	F	3	SCREW, CROSS-RECESS	
12	DY4-2527-000 000	F	1	WASHER	
12	DY4-2648-000 000	C	1	COASTER, LEFT	
12	DY4-2649-000 000	C	1	COASTER, RIGHT	
12	DY4-2650-000 000	C	1	GEAR, ASS'Y	
8	DY4-2651-000 000	C	1	LOADING MOTOR ASS'Y	
8	DY4-2652-000 000	C	1	ROLLER ASS'Y	
10	DY4-2653-000 000	C	1	ARM, PINCH	
12	DY4-2654-000 000	C	1	GEAR, ASS'Y	
12	DY4-2655-000 000	C	1	LEVER, THREADING	
12	DY4-2656-000 000	C	1	GEAR, JOINT	
10	DY4-2657-000 000	C	1	LEVER, SWITCH	
12	DY4-2658-000 000	C	1	WORM ASS'Y	
12	DY4-2659-000 000	C	1	BRAKE, TS	
10	DY4-2660-000 000	C	1	BAND, TENSION	
12	DY4-2661-000 000	C	1	GEAR	
12	DY4-2662-000 000	C	1	ROLLER, GUIDE	
10	DY4-2663-000 000	C	1	REEL, SUPPLY	
10	DY4-2664-000 000	C	1	ARM, TG7	
12	DY4-2665-000 000	C	1	ARM, PINCH SUB	
10	DY4-2666-000 000	C	1	REEL, TAKE UP	
10	DY4-2669-000 000	C	1	ARM	
12	DY4-2671-000 000	C	1	PULLY, RELAY	
12	DY4-2672-000 000	C	1	PLATE, SS	
8	DY4-2673-000 000	C	1	CASSETTE COMPARTMENT ASS'Y	
12	DY4-2674-000 000	C	1	ROLLER, GUIDE	
8	DY4-2675-000 000	C	1	TERMINAL, EARTH	
10	DY4-2676-000 000	C	1	SWITCH	
10	DY4-2677-000 000	C	1	SWITCH, SLIDE	
10	DY4-2678-000 000	C	1	SWITCH, PUSH	
10	DY4-2679-000 000	C	1	FLEXIBLE P.C.B. (1)	
10	DY4-2680-000 000	C	1	FLEXIBLE P.C.B. (2)	
10,12	DY4-2681-000 000	F	4	WASHER	
12	DY4-2684-000 000	C	1	PLATE, TT	
12	DY4-2685-000 000	C	2	SPRING, LEAF	
12	DY4-2686-000 000	F	2	SCREW, CROSS-RECESS	
12	DY4-2687-000 000	C	1	GEAR, WHEEL	
10,12	DY4-2688-000 000	F	6	WASHER	
12	DY4-2689-000 000	F	2	SCREW, CROSS-RECESS	
10	DY4-2690-000 000	C	1	PLATE, TL	
10	DY4-2691-000 000	C	1	BRAKE, LB	
10	DY4-2692-000 000	C	1	LEVER, LB	
12	DY4-2693-000 000	C	1	ARM, RELEASE	
12	DY4-2694-000 000	C	1	GEAR, UL	
12	DY4-2695-000 000	C	1	ARM, UL	
10	DY4-2696-000 000	C	4	PIN, SHAFT	
10	DY4-2697-000 000	C	1	SPRING, COIL	
12	DY4-2698-000 000	C	1	SPRING, COIL	
10	DY4-2699-000 000	C	1	SPRING, COIL	
12	DY4-2700-000 000	C	1	SPRING	
10	DY4-2701-000 000	C	1	FLANGE, TG2	
10	DY4-2702-000 000	C	1	ROLLER, TG2	
10	DY4-2703-000 000	C	1	FLANGE, TG2	
10	DY4-2704-000 000	C	1	SLEEVE, TG2	
10	DY4-2705-000 000	C	1	SPRING, COIL	
12	DY4-2706-000 000	C	1	SPRING, COIL	
10	DY4-2707-000 000	C	1	SPRING, PLATE	

PARTS LIST

PAGE	PART NO.	CLASS	QTY	DESCRIPTION	REMARKS
8	DY4-2708-000	000	C	1	SPRING, COIL
8	DY4-2709-000	000	C	1	GEAR, DAMPER
10	DY4-2710-000	000	C	1	HOLDER, LED
12	DY4-2711-000	000	C	1	LEVER, EJECT
10	DY4-2712-000	000	C	1	ARM, RELEASE
10	DY4-2713-000	000	C	1	BRAKE, S
10	DY4-2714-000	000	C	1	BRAKE, T
12	DY4-2715-000	000	C	1	BRAKE, UL
10	DY4-2716-000	000	C	1	ARM, STOPPER
10	DY4-2717-000	000	C	1	ARM, ADJUST
12	DY4-2718-000	000	E	1	BELT (L), TIMING
12	DY4-2719-000	000	E	1	BELT (S), TIMING
8	DY4-2720-000	000	C	1	DAMPER, OIL
8	DY4-2721-000	000	C	1	GUARD, GUIDE
10	DY4-2722-000	000	C	2	HOLDER, SENSOR
10	DY4-2723-000	000	C	1	STOPPER, RK
10	DY4-2724-000	000	C	1	SPRING, COIL
10	DY4-2725-000	000	C	1	PLATE, SWITCH
8	DY4-2726-000	000	C	1	CAPSTAN MOTOR
8,10	DY4-2727-000	000	F	11	SCREW, CROSS-RECESS
8,10,12	DY4-2728-000	000	F	7	SCREW, CROSS-RECESS
8	DY4-2729-000	000	C	2	TAPE
8	DY4-2730-000	000	F	5	SCREW, CROSS-RECESS
8	DY4-2732-000	000	E	1	DRUM ASS'Y
8	DY4-2733-000	000	E	1	UPPER DRUM ASS'Y
					E90E,F ONLY E90E,F ONLY
12	DY4-2742-000	000	C	1	GEAR
12	DY4-2743-000	000	C	1	GEAR
8	DY4-4300-000	000	E	1	DRUM ASS'Y
8	DY4-4301-000	000	E	1	UPPER DRUM ASS'Y
14	DY5-1467-000	000	C	1	CORD, BATTERY
					E57A ONLY E57A ONLY
14	DY5-1468-000	000	C	1	NUT
14	DY5-1469-000	000	C	1	SHOE, ASS'Y
14	DY5-1470-000	000	C	1	WASHER
14	DY5-1471-000	000	C	1	SCREW, CROSS-RECESS
	VC5-0700-226	000	C	1	CAPACITOR, 22μF 10V
△	VC5-9520-102	000	C	1	CAPACITOR, 1000pF 1KV
△	VC5-9700-300	000	C	1	CAPACITOR, TRIMMER 30pF
△	VC5-9850-332	003	C	1	CAPACITOR, 3300pF 100V
	VC6-0340-100	000	C	2	CAPACITOR, TRIMMER 10pF
	VC6-0340-300	000	C	2	CAPACITOR, TRIMMER 30pF
△	VC6-1570-152	200	C	1	CAPACITOR, 1500pF 500V
	VC6-4130-476	000	C	1	CAPACITOR, 47μF 16V
	VC6-4140-475	000	C	1	CAPACITOR, 4.7μF 25V
	VC6-5370-336	000	C	1	CAPACITOR, 33μF 10V
△	VR5-4640-205	000	C	1	RESISTOR, VARIABLE 2MΩ
	VR5-4640-504	000	C	1	RESISTOR, VARIABLE 500KΩ
	VR5-7680-201	000	C	1	RESISTOR, VARIABLE 200Ω
	VR5-7680-503	000	C	2	RESISTOR, VARIABLE 50KΩ
	VR5-7780-102	000	C	1	RESISTOR, VARIABLE 1KΩ
	VR5-7780-103	000	C	5(6)	RESISTOR, VARIABLE 10KΩ
	VR5-7780-104	000	C	1	RESISTOR, VARIABLE 100KΩ
	VR5-7780-222	000	C	3	RESISTOR, VARIABLE 2.2KΩ
	VR5-7780-223	000	C	2(3)	RESISTOR, VARIABLE 22KΩ
	VR5-7780-332	000	C	1	RESISTOR, VARIABLE 3.3KΩ
	VR5-7780-472	000	C	2(1)	RESISTOR, VARIABLE 4.7KΩ
	VR7-0520-103	000	C	9(8)	RESISTOR, VARIABLE 10KΩ
	VR7-0520-472	000	C	8	RESISTOR, VARIABLE 4.7KΩ
	VS1-0875-011	000	C	1	CONNECTOR 11P
	VS1-0875-013	000	C	1	CONNECTOR 13P
	VS1-0875-015	000	C	1	CONNECTOR 15P

PARTS LIST

PAGE	PART NO.	CLASS	QTY	DESCRIPTION	REMARKS
	VS1-0875-025	000	C	1	CONNECTOR 25P
	VS1-1169-025	000	C	1	CONNECTOR 25P
	WA1-0380-000	000	B	2	DIODE MA157
	WA1-0384-000	000	B	1	ZENER DIODE RD5.6MB2
	WA1-0696-000	000	B	1	DIODE MA152WA
	WA1-0547-000	201	B	2	DIODE 1SS184
	WA1-0604-000	000	B	1	DIODE MA159
	WA1-0612-000	201	B	2	DIODE E10QS03
	WA1-0962-000	000	B	2	DIODE MA121
	WA1-0989-000	000	B	2	DIODE MA3100W
	WA1-1084-000	000	B	20	DIODE MA110
	WA1-1123-000	000	B	1	DIODE AG01Z
	WA1-1124-000	000	B	1	DIODE SHV02
	WA1-1146-000	000	B	3	DIODE MA707
	WA1-1194-000	000	B	1	DIODE MA728
	WA1-5091-000	000	B	1	DIODE 1SV205
	WA2-0052-000	000	B	3	TRANSISTOR 2SC1621
	WA2-0393-000	201	B	2	TRANSISTOR 2SA1162
	WA2-0646-000	000	B	1	TRANSISTOR 2SD1328
	WA2-0735-000	201	B	18	TRANSISTOR 2SC2712
	WA2-0759-000	000	B	4	TRANSISTOR DTA144EK
	WA2-0760-000	000	B	1	TRANSISTOR DTC114TK
	WA2-0797-000	201	B	4	TRANSISTOR 2SA1213
	WA2-0839-000	000	B	1	TRANSISTOR 2SA1226
	WA2-0884-000	000	B	7	TRANSISTOR DTC144EK
	WA2-1121-000	000	B	1	TRANSISTOR DTC143EK
	WA2-1172-000	000	B	3	TRANSISTOR 2SA1461
	WA2-1198-000	000	B	1	TRANSISTOR IMD2
	WA2-1228-000	000	B	3	TRANSISTOR IMT2
	WA2-1230-000	000	B	2(4)	TRANSISTOR IMH6
	WA2-1232-000	000	B	6	TRANSISTOR IMZ1
	WA2-1234-000	000	B	13	TRANSISTOR IMX2
	WA2-1256-000	000	B	1	TRANSISTOR IMH5
	WA2-1298-000	000	B	1	TRANSISTOR DTC124TK
	WA2-1368-000	000	B	2	TRANSISTOR DTC114EK
	WA2-1378-000	000	B	1	TRANSISTOR DTC144EU
	WA2-1386-000	000	B	1	TRANSISTOR DTA114EK
	WA2-1436-000	000	B	1	TRANSISTOR 2SB962-Z
	WA2-1496-000	000	B	1	TRANSISTOR IMB8
	WA2-1498-000	000	B	9	TRANSISTOR 2SA1162
	WA2-1501-000	000	B	1	FET 2SK198
	WA2-5151-000	000	B	1	TRANSISTOR 2SD968A-S
	WA2-5221-000	000	B	1	TRANSISTOR 2SD1757
	WA2-5222-000	000	B	1	FET 2SK1468
	WA3-3301-000	000	B	1	IC MN3818S
	WA3-3679-000	000	B	1	IC MN3820S
	WA3-5362-000	000	B	1	IC MN3107CS
	WA4-0349-000	201	B	2	IC NJM2904M
	WA4-0458-000	000	B	1	IC NJM3414M
	WA4-0509-000	000	B	1	IC NJM2043M
	WA4-0901-000	000	B	1	IC AN2011S
	WA4-1145-000	000	B	1	IC RH5VA45AA
	WA4-1167-000	000	B	1	IC RH5RA50AA
	WA4-1231-000	000	B	1	IC LB1631M
	WA4-1322-000	000	B	1	IC AN2514S
	WD1-0229-000	000	D	1	FUSE 2A 125V
	WD1-5005-000	000	D	1	FUSE 1.6A 125V
	WD8-5005-000	000	D	1	LINK IC D1600
2	XAL-6200-309	000	F	2	SCREW, CROSS-RECESS, PH
4	XAL-6200-407	000	F	1	SCREW, CROSS-RECESS, PH

E57A ONLY

E57A ONLY

E90E,F ONLY

E57A ONLY
E57A ONLY
E90E,F ONLY

PARTS LIST

PAGE	PART NO.	CLASS	QTY	DESCRIPTION	REMARKS
2	XA1-6200-509 000	F	4	SCREW, CROSS-RECESS, PH	
2	XA1-6200-759 000	F	2	SCREW, CROSS-RECESS, PH	
4,6	XA1-7200-307 000	F	12	SCREW, CROSS-RECESS, PH	
2	XA1-7200-359 000	F	2	SCREW, CROSS-RECESS, PH	
2	XA1-7200-407 000	F	1	SCREW, CROSS-RECESS, PH	
2	XA1-7200-409 000	F	2	SCREW, CROSS-RECESS, PH	
4	XA4-2170-707 000	F	2	SCREW, CROSS-RECESS, PH	
4	XA4-3200-507 000	F	1	SCREW, CROSS-RECESS, PH	
4	XA4-4170-407 000	F	1	SCREW, CROSS-RECESS, PH	
4	XA4-4200-507 000	F	1	SCREW, CROSS-RECESS, PH	
2	XA4-7200-459 000	F	4	SCREW, CROSS-RECESS, PH	
2	XA4-7200-609 000	F	2	SCREW, CROSS-RECESS, PH	
4	XA4-8260-509 000	F	2	SCREW, CROSS-RECESS, PH	
4	XA4-9170-557 000	F	3	SCREW, CROSS-RECESS, PH	
2	XA4-9200-409 000	F	3	SCREW, CROSS-RECESS, PH	
4	XA4-9200-509 000	F	4	SCREW, CROSS-RECESS, PH	
4	XA4-9200-609 000	F	3	SCREW, CROSS-RECESS, PH	
2	XA4-9260-709 000	F	4	SCREW, CROSS-RECESS, PH	
2	XA9-0435-000 000	F	2	SCREW, CROSS-RECESS, PH	
2	XA9-0503-000 000	F	3	SCREW, CROSS-RECESS, PH	
4	XB4-6260-607 000	F	1	SCREW M2.6x6	
4	X96-1723-610 000	F	2	SCREW, SLOTTED SHOULDER	
4	YA1-0031-000 000	C	1	HOLDER, CAMERA (A)	
4	YA1-0205-000 000	B	1	SHEET, ZOOM	
4	YG9-5048-000 000	C	1	RELAY LENS ASS'Y	
4	YG9-5053-000 000	C	1	AF MOTOR ASS'Y	
4	YG9-5054-000 000	C	1	PZ MOTOR ASS'Y	
10	Y22-8012-000 000	B	1	LED GL452S	
8	Y22-8120-000 000	B	1	SENSOR, DEW	
10	Y22-8121-000 000	B	2	PHOTO IC SPI-315-25-CD	
10	Y22-8123-000 000	B	2	PHOTO TRANSISTOR EE-P109	

CONTENTS

CHAPTER IV. DIAGRAMS

1.	Interconnection Diagram	IV-1
2.	Block Diagrams	
2-1	Camera section	IV-2
3.	Circuit Board/Schematic Diagrams	
3-1	SENSOR-GRIP C.B.A.	IV-3, 4

Guide to diagrams

1. Color coding

(1) Signal lines in block diagrams

Camera section

Red	(———)	: Y
	(----)	: C

(2) Voltage on circuit diagrams

Red	: Recording
Black	: Playback

(3) Signal lines on circuit diagrams

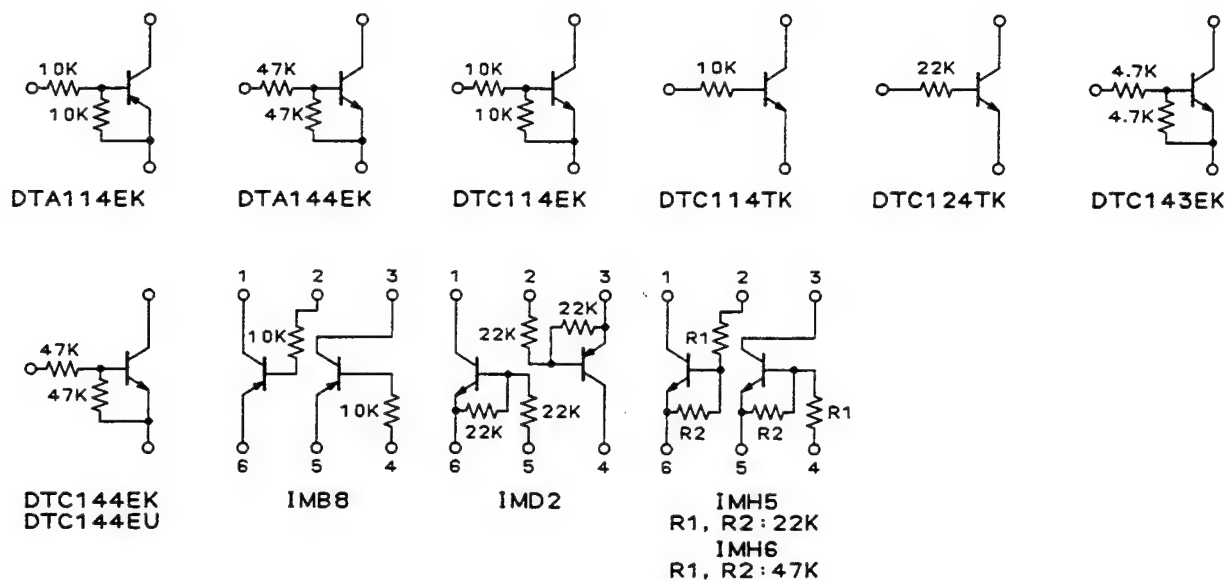
Camera section

Red	: Power supply line
Orange	: Chrominance signal
Gray (▨▨▨▨)	: Luminance + Chrominance signals

(4) PC board layout

Orange	: Component side
Netted black (▨▨▨▨)	: Soldering side
Black	: Parts on component side
Blue	: Parts on soldering side

2. Equivalent circuits of digital transistor



3. Indications on circuit diagram

Resistance is represented in ohms (Ω).

Capacitance is represented in farads (F).

Voltages of capacitor are 25 V unless otherwise specified.

Wattage of resistor is 1/16 W unless otherwise specified.

Voltages are measured with a digital voltmeter.

Waveform photographs are taken by using a 10:1 probe.

IC No. in each C.B.A.s are listed on the bottom of diagrams.

No. colored in blue are corresponded to the No. of waveform photographs.

Voltage values indicated in circuit diagram are based on the following condition.

Camera section

Color bar or Gray scale, standard angle of view, AWB-preset

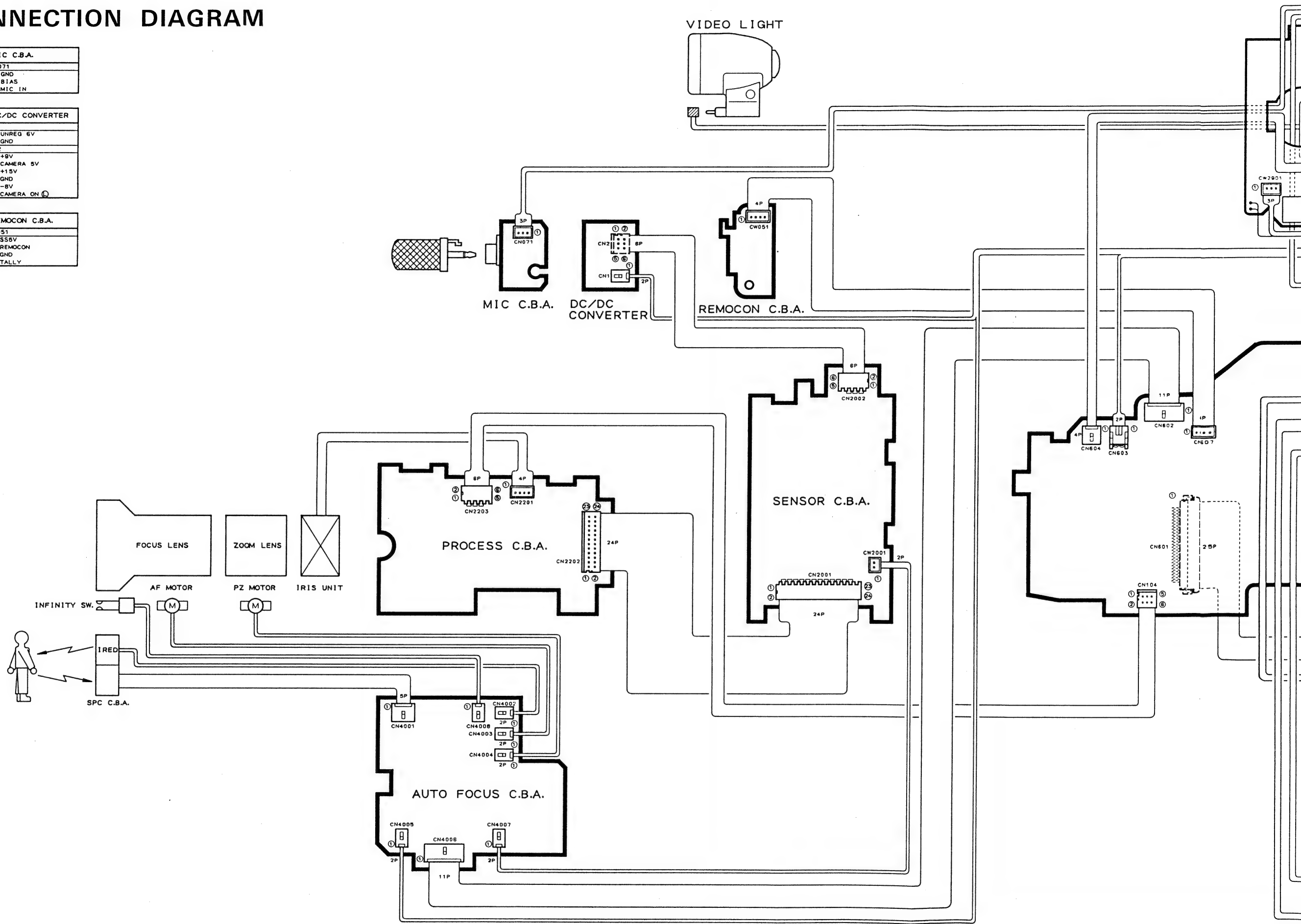
INTERCONNECTION DIAGRAM

PROCESS C.B.A.
CN2201
1 D+
2 C+
3 D-
4 C-
CN2202
1 S/H OUT
2 GND
3 CAMERA 5V
4 GND
5 SYNC
6 BF
7 CP2 + P BLK
8 CP2 + C BLK
9 C BLK
10 W BLK
11 SC
12 GND
13 SC (90)
14 CP2
15 FH/2
16 CPOB
17 CSP1
18 CSP2
19 PLL
20 CAMERA ON
21 C0H
22 C1H
23 Y0H
24 Y1H
CN2203
1 CAMERA (Y)
2 GND
3 CAMERA (C)
4 GND
5 CAMERA FADE
6 CAMERA ON

MIC C.B.A.
CN071
1 GND
2 BIAS
3 MIC IN
DC/DC CONVERTER
CN1
1 UNREQ 6V
2 GND
CN2
1 +9V
2 CAMERA 5V
3 +15V
4 GND
5 -8V
6 CAMERA ON
REMOCON C.B.A.
CW051
1 SS5V
2 REMOCON
3 GND
4 TALLY

SENSOR C.B.A.
CN2001
1 S/H OUT
2 GND
3 CAMERA 5V
4 GND
5 SYNC
6 BF
7 CP2 + P BLK
8 CP2 + C BLK
9 C BLK
10 W BLK
11 SC
12 GND
13 SC (90)
14 CP2
15 FH/2
16 CPOB
17 CSP1
18 CSP2
19 PLL
20 CAMERA ON
21 C0H
22 C1H
23 Y0H
24 Y1H
CN2002
1 +9V
2 CAMERA 5V
3 +15V
4 GND
5 -8V
6 CAMERA ON
CW2001
1 1/1000
2 CAMERA 5V

AF C.B.A.
CN4001
1 +5V (SPC)
2 SPC B
3 +3V
4 SPC A
5 GND (SPC)
CN4002
1 IRED A
2 IRED K
CN4003
1 FAR
2 NEAR
CN4004
1 WIDE
2 TELE
CN4005
1 UNREQ 6V
2 GND
CN4006
1 CAMERA ON
2 AF ON
3 GND
4 TELE
5 WIDE
6 KEY (1)
7 NC
8 CAMERA FADE
9 AUDIO FADE
10 SS5V
11 FADE
CN4007
1 1/1000
2 CAMERA 5V



EO LIGHT

MOCON C.B.A.

SENSOR C.B.A.

GRIP C.B.A.

RECORDER MAIN C.B.A.

HEAD AMP C.B.A.

RECORDER-KEY C.B.A.

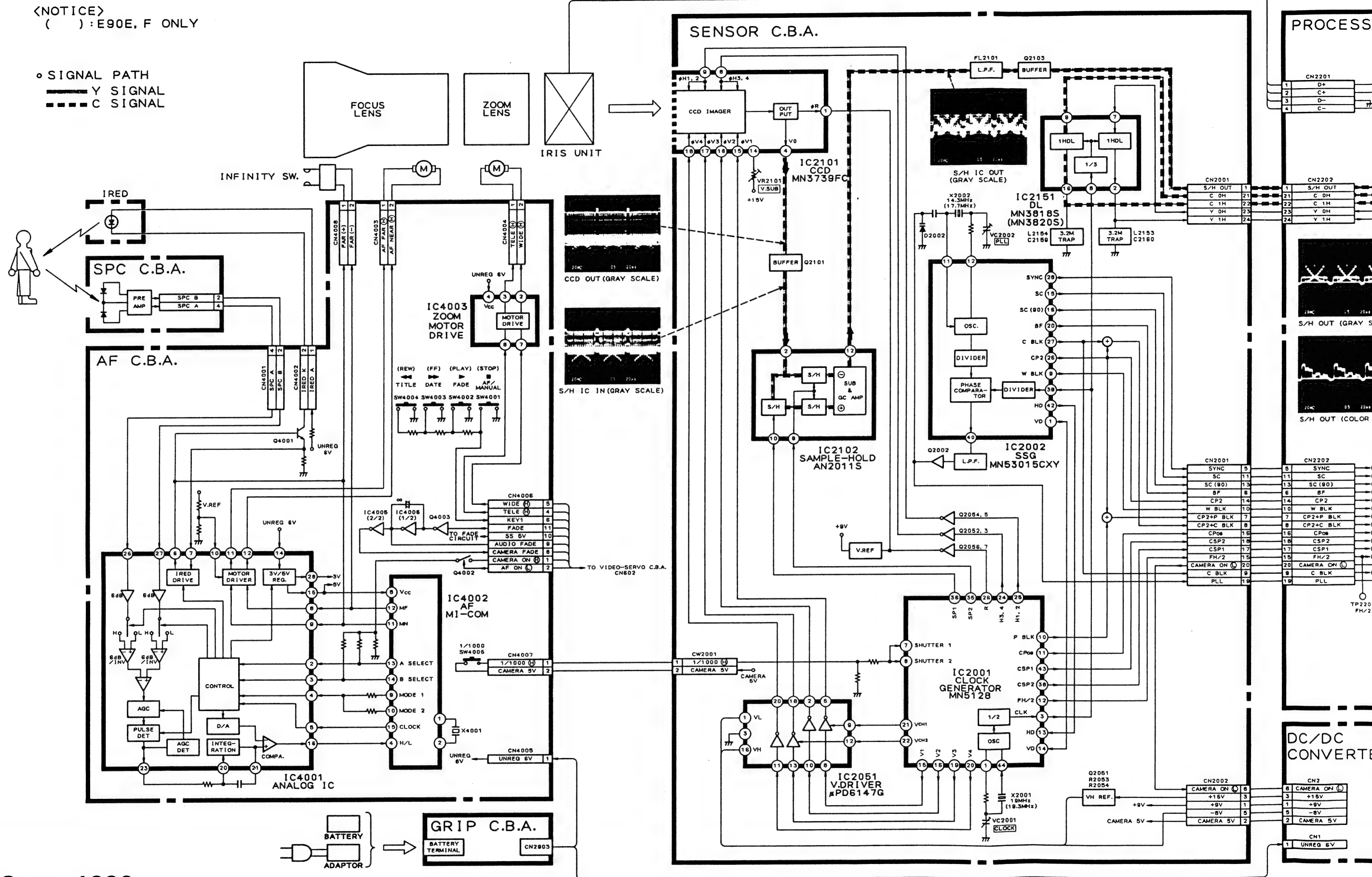
RECORDER MAIN C.B.A.	
CN102	1 UNREG 6V
	2 GND
CN103	1 MIC IN
	2 BIAS
	3 GND
CN104	1 CAMERA (V)
	2 GND
	3 CAMERA (C)
	4 GND
	5 CAMERA FADE
	6 CAMERA ON
CN105	1 EVF VIDEO
	2 EVF ON
	3 CHARACTER B
	4 CG-STROBE
	5 GND
	6 VC-DATA
	7 CLOCK 1
	8 GND
CN110	1 LINE IN
	2 A OUT
	3 GND
	4 A IN
	5 Y IN
	6 GND
	7 V OUT
	8 EJECT SW ON
	9 POWER SW ON
	10 SP/LP SW ON
	11 GND
	12 PB-RF
	13 HEAD SW PULSE
	14 TRACK SHIFT
CN301	1 GND
	2 CH-1
	3 AVSV
	4 GND
	5 AVSV
	6 CH-2
	7 GND
	8 GND
	9 GND
	10 GND
	11 GND
	12 FE HEAD
	13 GND
CN401	1 GND
	2 SSV
	3 C-FG2
	4 C-FG1
	5 W
	6 U
	7 H-
	8 V+
	9 V-
	10 H+
	11 U+
	12 U-
	13 V
	14 W+
	15 W-
CN402	1 D-FG
	2 D-PG
	3 COM
	4 GND
CN403	1 U
	2 V
	3 COM
	4 W
CN601	1 SSV
	2 MP /ME
	3 NC
	4 SAFETY TAB
	5 T-REEL FG
	6 TAPE SENS. LED
	7 BOT SENS.
	8 S-REEL FG
	9 MODE SW 3
	10 MODE SW 2
	11 MODE SW 1
	12 CASSETTE DOWN
	13 EOT SENS.
	14 GND
	15 CAMERA POWER LED
	16 RECORDER POWER LED
	17 KEY (2)
	18 POWER SW ON
	19 EJECT SW ON
	20 SHIFT SW ON
	21 + SW ON
	22 TITLE/DATE SW ON
	23 - SW ON
	24 NC
	25 EVER SV
CN602	1 CAMERA ON
	2 AF ON
	3 GND
	4 TELE
	5 WIDE
	6 KEY (1)
	7 NC
	8 CAMERA FADE
	9 AUDIO FADE
	10 SSV
	11 FADE
CN603	1 UNREG 6V
	2 GND

RECORDER MAIN C.B.A.	
CN604	1 TRIG SW ON
	2 TELE SW ON
	3 WIDE SW ON
	4 BATT.
CN605	1 DEW
	2 GND
CN606	1 LOAD, MTR (-)
	2 LOAD, MTR (+)
CN607	1 SSV
	2 REMOCON
	3 GND
	4 TALLY

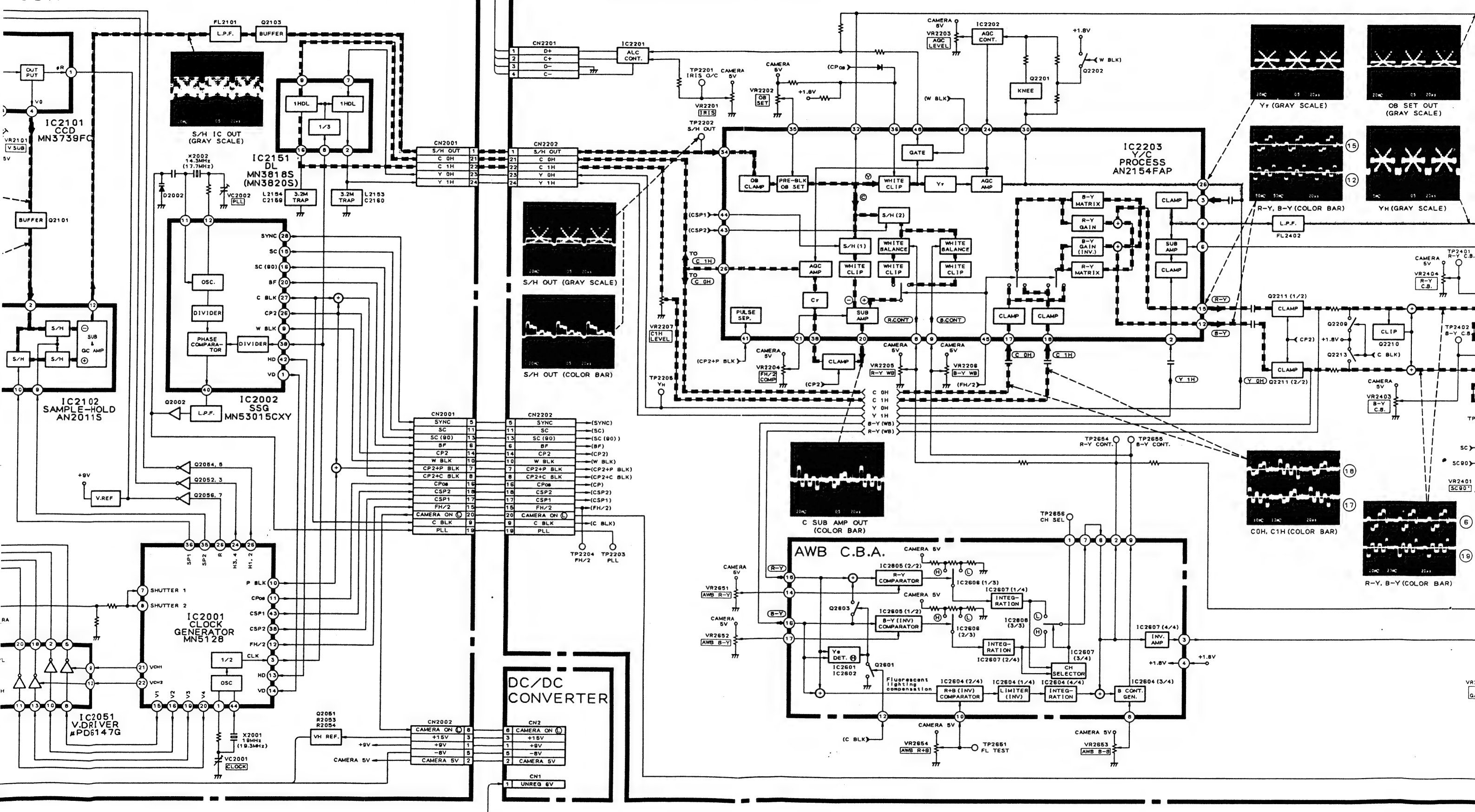
RECORDER-KEY C.B.A.	
CN001	1 SSV
	2 ME /MP
	3 HIMP
	4 SAFETE TAB
	5 TAPE SENS. LED
	6 SSV
	7 BOT SENS.
	8 SSV
	9 T-REEL FG
	10 SSV
	11 T-REEL LED (-)
CN002	1 S-REEL LED (-)
	2 SSV
	3 S-REEL FG
	4 MODE 3
	5 MODE 2
	6 MODE 1
	7 GND
	8 CASSETTE DOWN
	9 SSV
	10 EOT SENS.
	11 NC
	12 SSV
	13 NC
CN003	1 SSV
	2 MP /ME
	3 HIMP
	4 SAFETE TAB
	5 T-REEL FG
	6 TAPE SENS. LED
	7 BOT SENS.
	8 S-REEL FG
	9 MODE SW 3
	10 MODE SW 2
	11 MODE SW 1
	12 CASSETTE DOWN
	13 EOT SENS.
	14 GND
	15 CAMERA POWER LED
	16 RECORDER POWER LED
	17 KEY (2)
	18 POWER SW ON
	19 EJECT SW ON
	20 SHIFT SW ON
	21 + SW ON
	22 TITLE/DATE SW ON
	23 - SW ON
	24 NC
	25 EVER SV

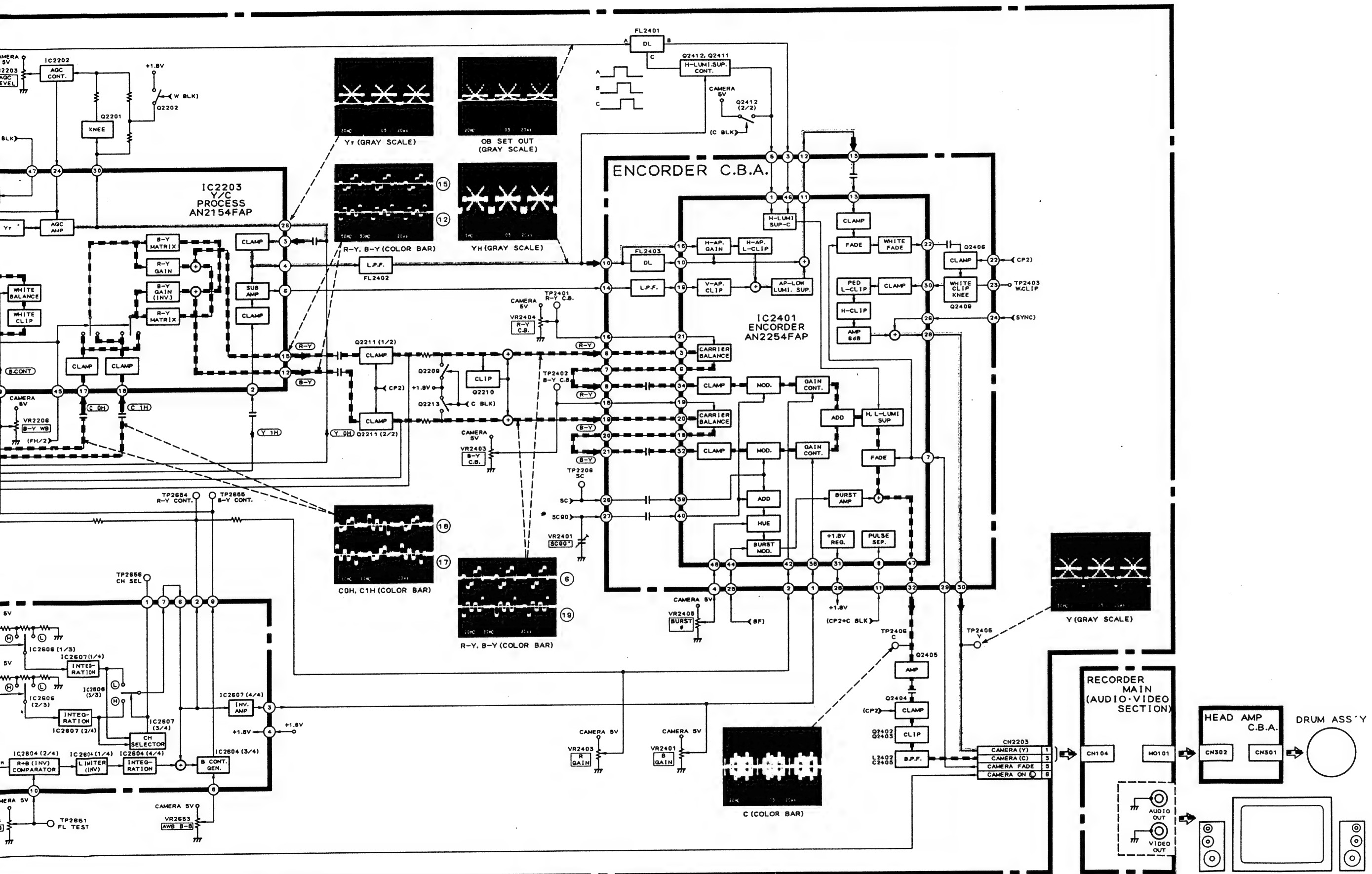
GRIP C.B.A.	
CN2901	1 GND
	2 CLOCK 1
	3 VC-DATA
	4 GND
	5 CG-STROBE
	6 CHARACTER B
	7 EVF ON
	8 EVF VIDEO
CN2902	1 H+
	2 H-
	3 V+
	4 V-
CN2903	1 UNREG 6V
	2 GND
	3 UNREG 6V
	4 GND
	5 UNREG 6V
	6 GND
	7 UNREG 6V
	8 GND
CN2904	1 TRIG SW ON
	2 TELE SW ON
	3 WIDE SW ON
	4 BATT.
CN2905	1 LIGHT (+)
	2 LIGHT (-)
CW2901	1 H
	2 G1
	3 K

BLOCK DIAGRAM CAMERA SECTION



PROCESS C.B.A.





CIRCUIT BOARD DIAGRAM SENSOR · GRIP C.B.A.

SIGNAL WAVEFORMS

< NOTICES for SENSOR C.B.A. >

1. This diagram can be used for the E57A and the E90E-F.

However, if you use this for the E90E-F, mind the following differences.

- ① Pin 9 of IC2001 : Connected to ground.
(E57A → Connected to CAMERA 5V)
- ② Pin 22 of IC2002 : Connected to ground
(E57A → Connected to CAMERA 5V)
- ③ C2075 (* See Fig. 1 below) : Added
(E57A → None)

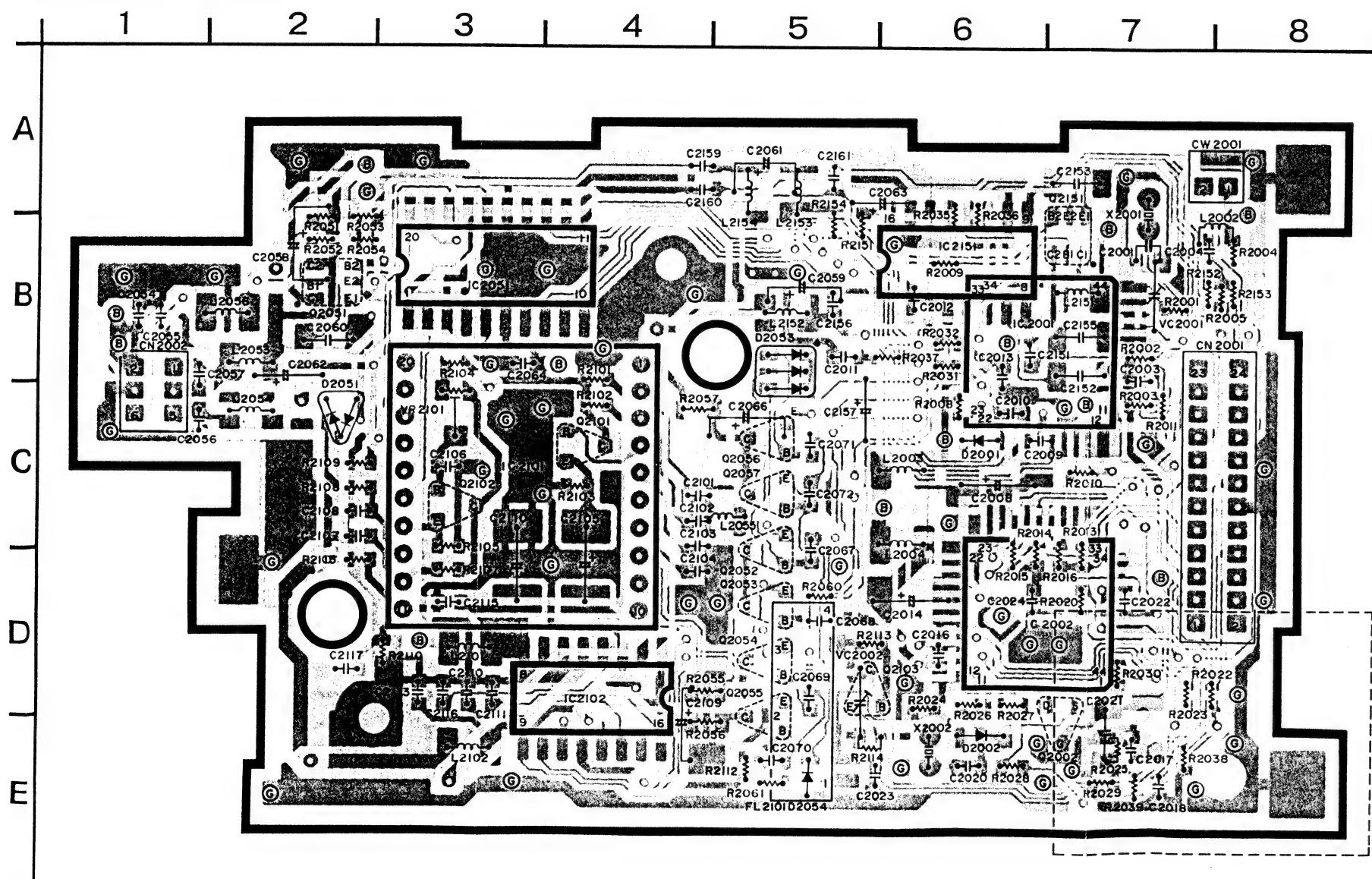
2. The C. B. A. consists of four layers.

(Soldering, Component, Ground and Camera 5V patterns.)

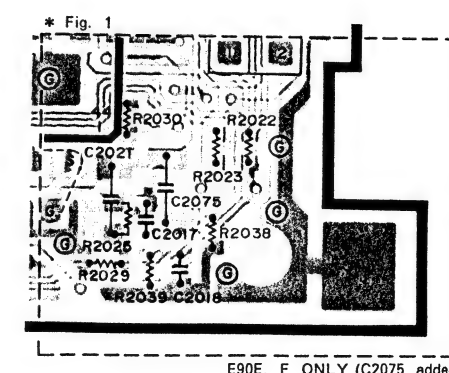
※ Through-hole marks on each C. B. A. denote :

- : Soldering side ↔ Component side
 (G) : Soldering side (Component side) ↔ Ground
 (B) : Soldering side (Component side) ↔ Camera 5V

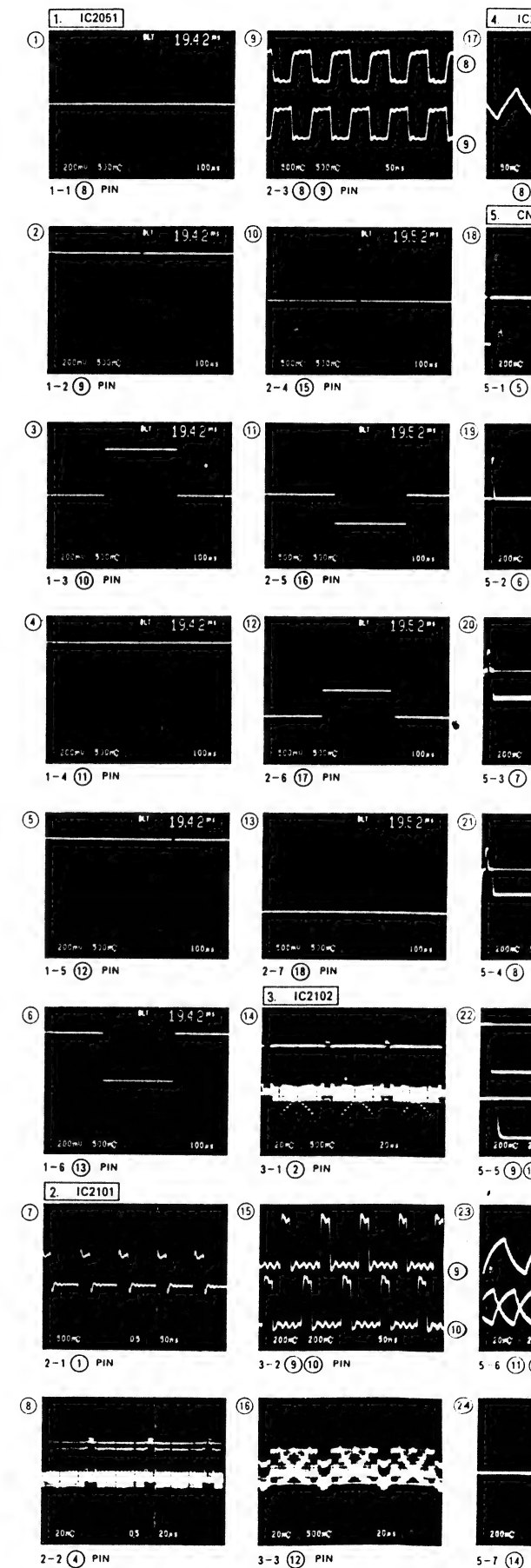
SENSOR C.B.A.



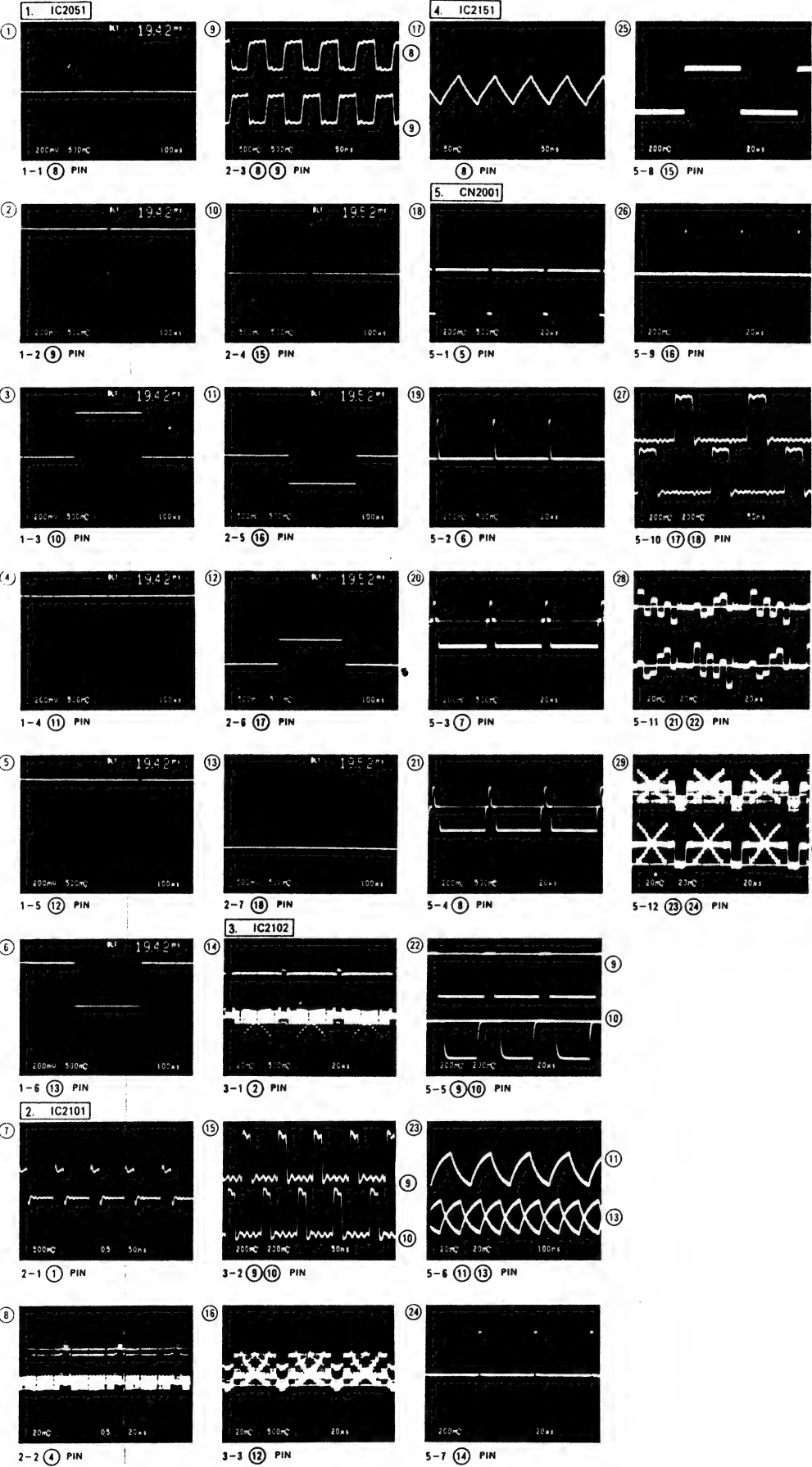
D 2 0 0 1	C - 6
D 2 0 0 2	E - 6
D 2 0 5 1	C - 2
D 2 0 5 3	B - 5
D 2 0 5 4	E - 5
I C 2 0 0 1	B - 6
I C 2 0 0 2	D - 7
I C 2 0 5 1	B - 3
I C 2 1 0 1	C - 3
I C 2 1 0 2	D - 4
I C 2 1 5 1	B - 6
Q 2 0 0 2	E - 7
Q 2 0 5 1	B - 2
Q 2 0 5 2	D - 5
Q 2 0 5 3	D - 5
Q 2 0 5 4	D - 5
Q 2 0 5 5	D - 5
Q 2 0 5 6	C - 5
Q 2 0 5 7	C - 5
Q 2 1 0 1	C - 4
Q 2 1 0 2	C - 3
Q 2 1 0 3	D - 5
Q 2 1 5 1	B - 7
V C 2 0 0 1	B - 7
V C 2 0 0 2	D - 5
V R 2 1 0 1	C - 3



E90E F ONLY (C2075 addres



SIGNAL WAVEFORMS



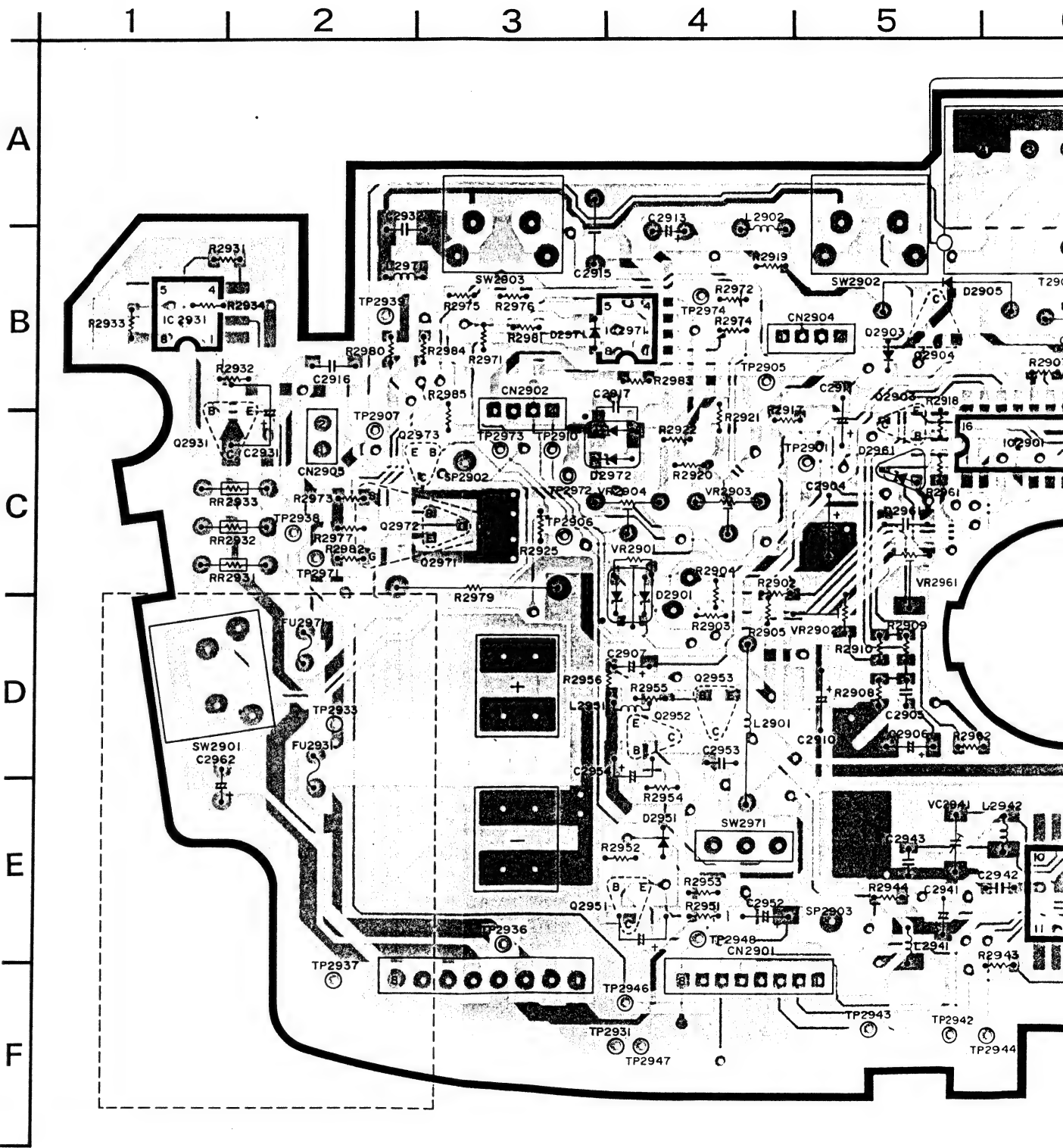
GRIP C.B.A.

D 2 9 0 1	D - 4
D 2 9 0 2	D - 7
D 2 9 0 3	B - 5
D 2 9 0 4	B - 6
D 2 9 0 5	B - 5
D 2 9 5 1	E - 4
D 2 9 6 1	C - 5
D 2 9 7 1	B - 3
D 2 9 7 2	C - 4
I C 2 9 0 1	C - 6
I C 2 9 3 1	B - 1
I C 2 9 4 1	E - 6
I C 2 9 7 1	B - 4
Q 2 9 0 1	C - 7
Q 2 9 0 2	B - 7
Q 2 9 0 3	C - 5
Q 2 9 0 4	B - 5
Q 2 9 3 1	C - 1
Q 2 9 5 1	E - 4
Q 2 9 5 2	D - 4
Q 2 9 7 1	C - 3
Q 2 9 7 2	C - 3
Q 2 9 7 3	C - 3
T P 2 9 0 1	C - 5
T P 2 9 0 4	B - 7
T P 2 9 0 5	B - 4
T P 2 9 0 6	C - 3
T P 2 9 0 7	C - 2
T P 2 9 1 0	C - 3
T P 2 9 1 2	E - 7
T P 2 9 1 3	A - 7
T P 2 9 1 4	C - 7
T P 2 9 1 5	E - 7
T P 2 9 3 1	F - 4
T P 2 9 3 3	D - 2
T P 2 9 3 6	E - 3
T P 2 9 3 7	F - 2
T P 2 9 3 8	C - 2
T P 2 9 3 9	B - 2
T P 2 9 4 2	F - 5
T P 2 9 4 3	F - 5
T P 2 9 4 4	F - 6
T P 2 9 4 6	F - 4
T P 2 9 4 7	F - 4
T P 2 9 4 8	E - 4
T P 2 9 7 1	C - 2
T P 2 9 7 2	C - 3
T P 2 9 7 3	C - 3
T P 2 9 7 4	B - 4
V C 2 9 4 1	E - 5
V R 2 9 0 1	C - 4
V R 2 9 0 2	D - 5
V R 2 9 0 3	C - 4
V R 2 9 0 4	C - 4
V R 2 9 6 1	C - 5

< NOTICE >

This diagram is only for the E57A. For the E90E,F, refer to the Fig 1. The differences between the E57A's and the E90E,F's are as follows.

E57A	E90E,F
FU2971	RR2971
FU2931	RR2934

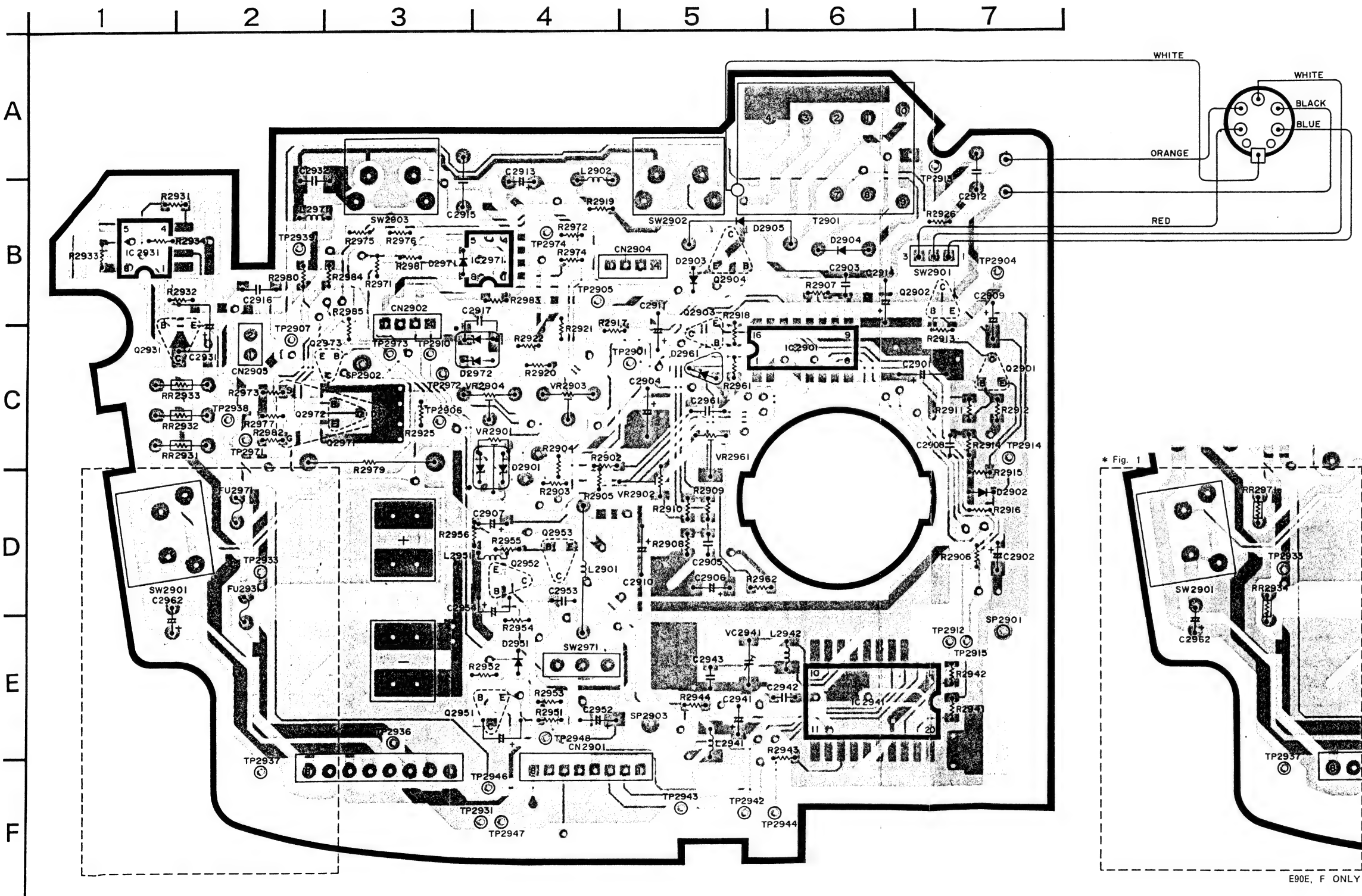
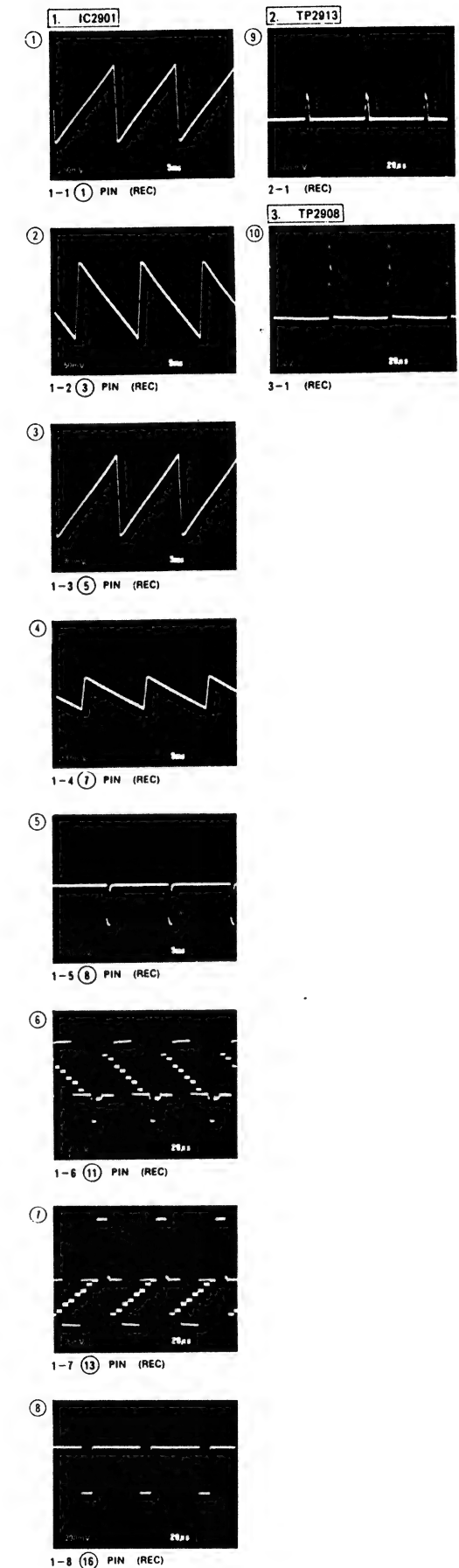


< NOTICE >

This diagram is only for the
E57A. For the E90E,F, refer to the Fig 1.
The differences between the E57A's and
the E90E,F's are as follows.

E57A	E90E,F
FU2971	RR2971
FU2931	RR2934

SIGNAL WAVEFORMS



SCHEMATIC DIAGRAM SENSOR • GRIP C.B.A.

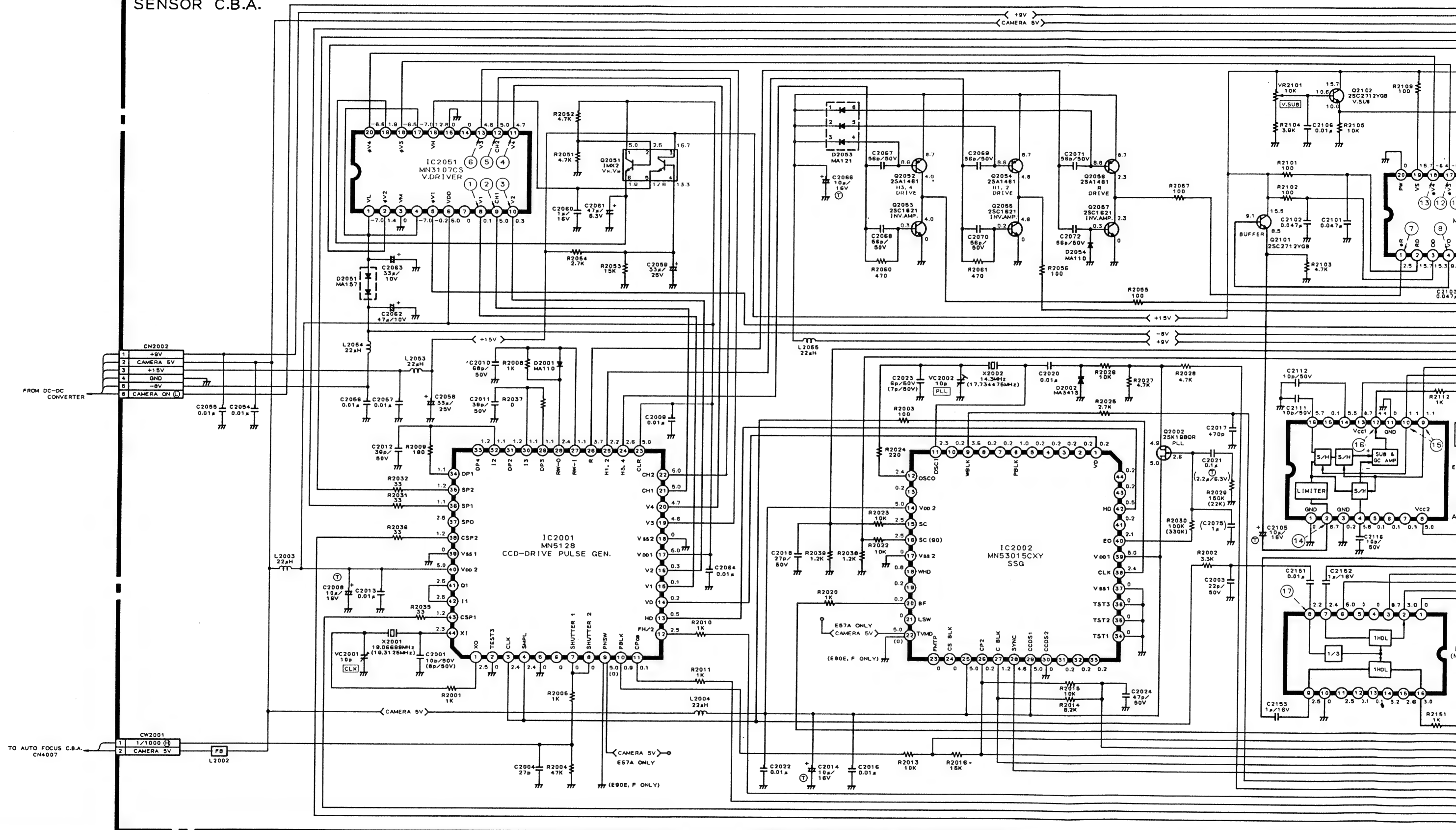
<NOTICE>
() : E90E, F ONLY

- SIGNAL PATH

Y+C SIGNAL (GRAY)

C SIGNAL (ORANGE)

SENSOR C.B.A.



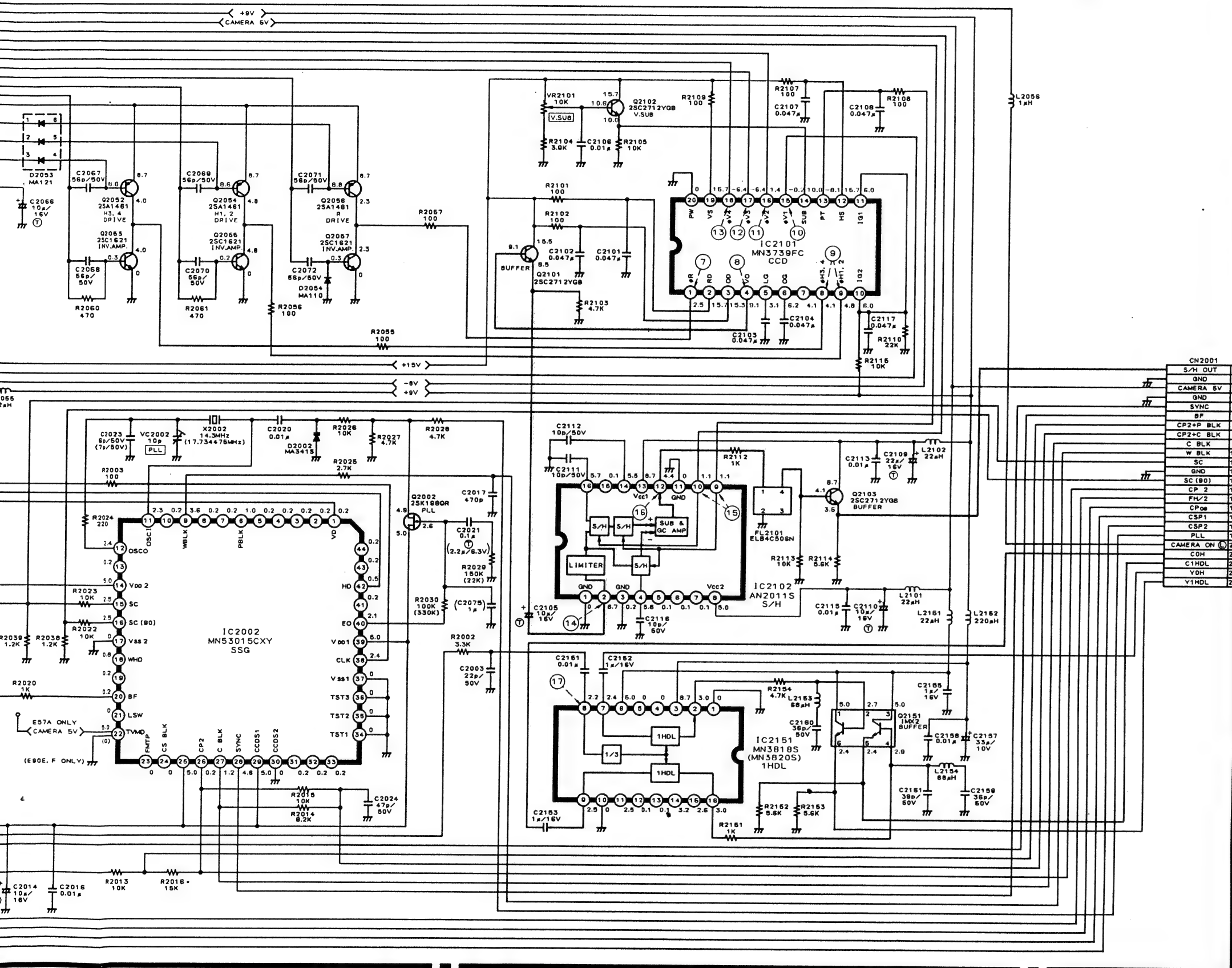
IC2051

IC2001

IC2002

IC2102 IC2151 IC

SIGNAL (GRAY) C SIGNAL (ORANGE)

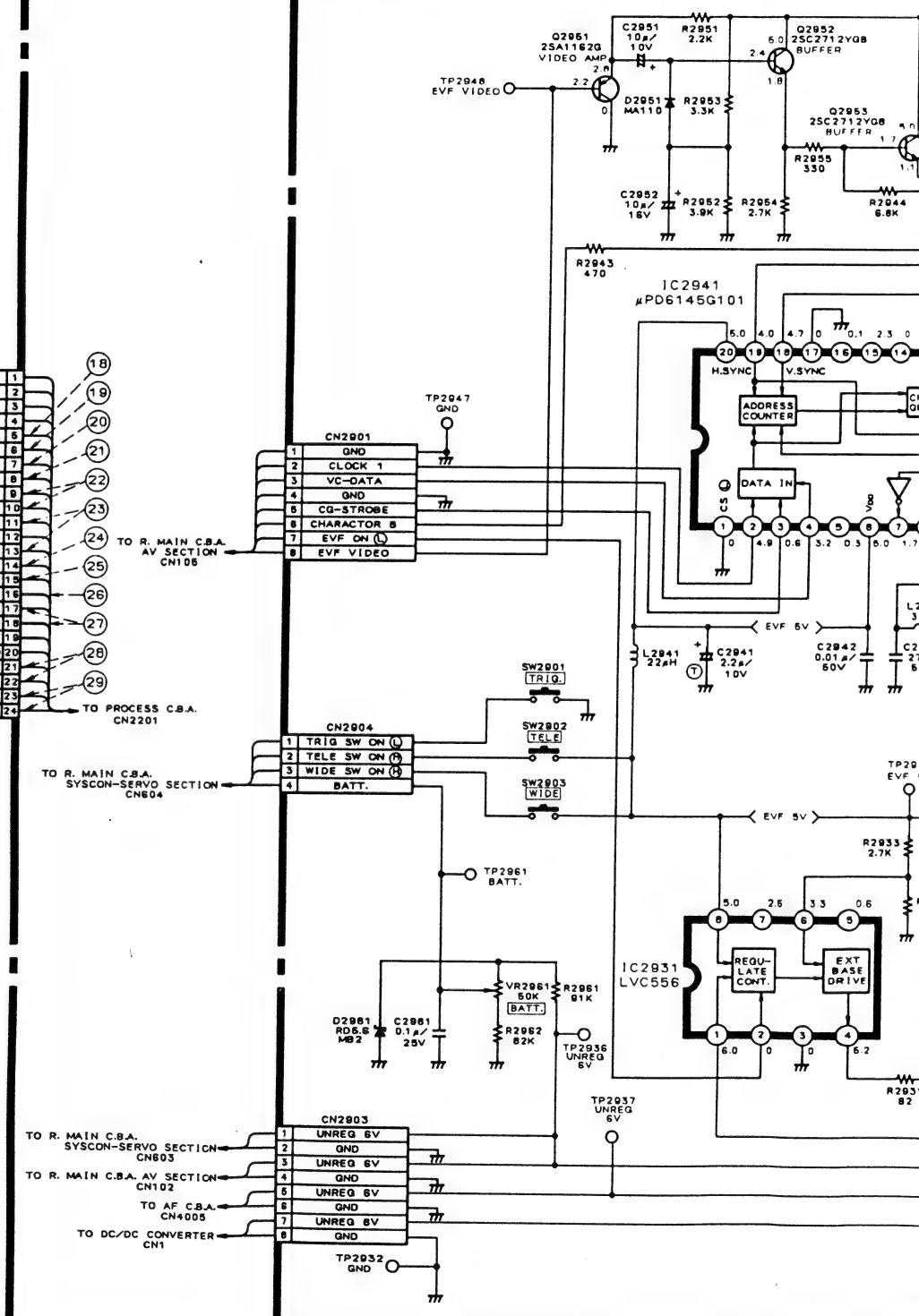


IC2002

IC2102 IC2151 IC2101

<NOTICE>
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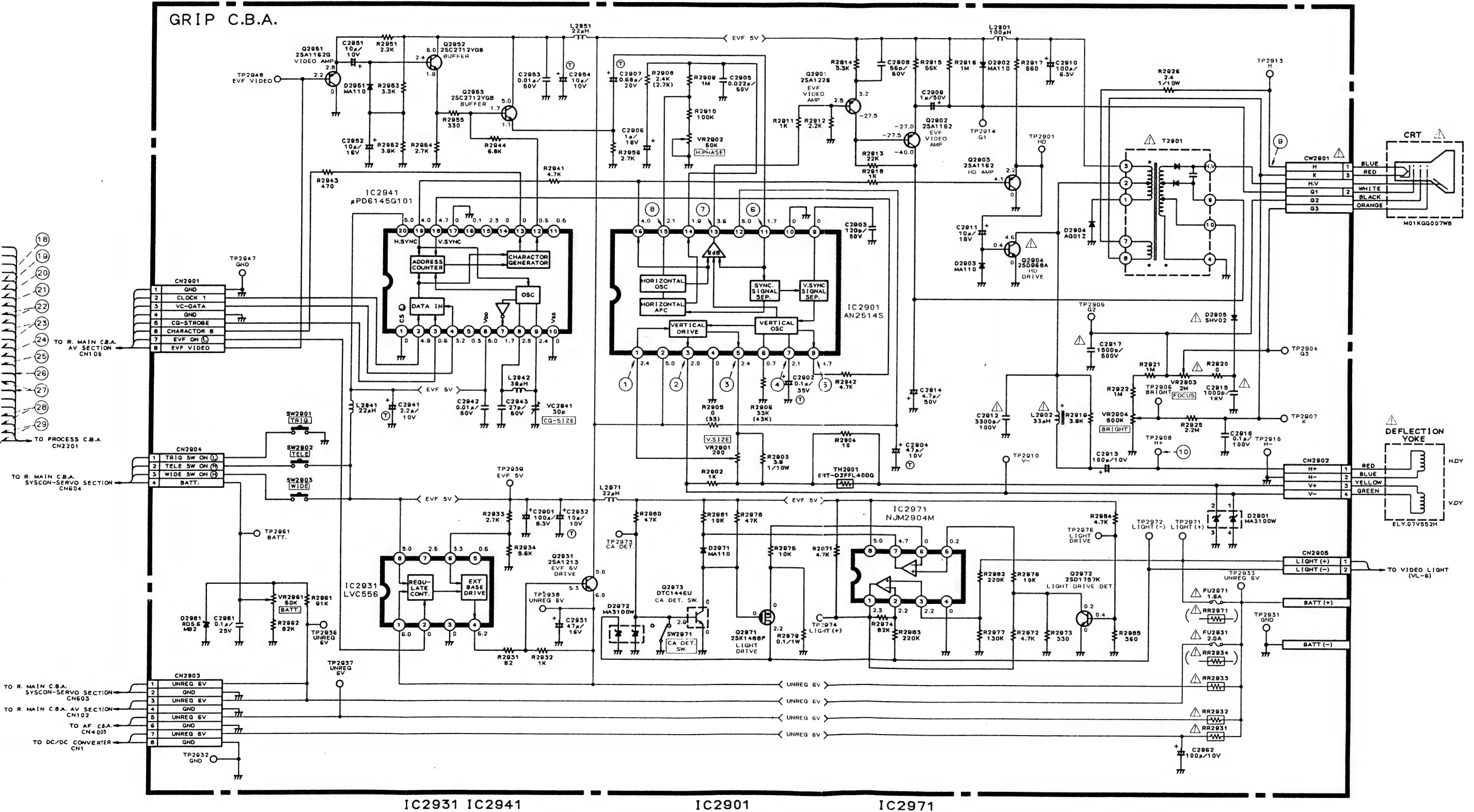
GRIP C.B.A.



IC2931 IC2941

<NOTICE>
() : E90E, F ONLY

GRIP C.B.A.



Canovision 8

SERVICE MANUAL

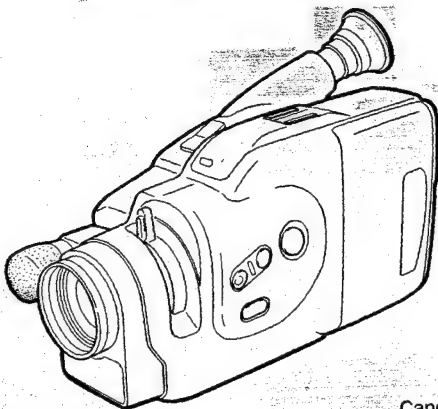
E30E,F

(REF. NO. D15-2330, 2370)

8mm Video Camera & Recorder

PAL

SECAM



DY8-1152-330-000

© CANON INC. 1989

Canon Inc.
Video Technical Service Dept.
First Edition: Oct. 1989
Printed in Japan

SAFETY PRECAUTIONS

The following precautions should be observed when servicing.

1. Since many parts in the unit have special safety-related characteristics, always use genuine CANON replacement parts.

Especially critical parts in the power circuit block should not be replaced with other makes.

Critical parts are marked with Δ in the schematic diagrams.

2. The primary source of X-ray radiation in this viewfinder is the picture tube. The tube used in the viewfinder is especially constructed to limit X-ray radiation emission. For continued X-ray radiation protection, the replacement tube must be same type as the original, CANON approved one.
3. When servicing, observe the original lead dress. If a short circuit is found, replace all parts which have been overheated or damaged by the short circuit.
4. After servicing, see to it that all the protective devices such as insulation barriers, insulation papers shields are properly installed.
5. After servicing, make the following leakage current checks to prevent the customer from being exposed to shock hazards.

5-1 Leakage Current Cold Check

- 1) Unplug the AC cord and connect a jumper between the two prongs on the plug.
- 2) Measure the resistance value, with an ohmmeter, between the jumpered AC plug and each exposed metallic cabinet part on the equipment such as screwheads, connectors, control shafts, etc. When the exposed metallic part has a return path to the chassis, the reading should be between $1M\Omega$ and $5.2M\Omega$. When the exposed metal does not have a return path to the chassis, the reading must be ∞ .

5-2 Leakage Current Hot Check

- 1) Plug the AC cord directly into the AC outlet. Do not use an isolation transformer for this check.
- 2) Connect a $1.5K\Omega$ 10 watt resistor, paralleled by $0.15\mu F$ capacitor, between each exposed metallic parts on the unit and a good earth ground such as a water pipe, as shown in figure 1.
- 3) Use an AC voltmeter, with 1000Ω volt or more sensitivity, to measure the potential across the resistor.
- 4) Check all exposed metallic parts of the cover (Cable connection, Handle bracket, metallic cabinet, Screwheads, Metallic overlays, etc), and measure the voltage at each point.
- 5) Reverse the AC plug in the AC outlet and repeat each of the above measurements.
- 6) The potential at any point should not exceed 0.75V RMS.

A leakage current tester (FLUKE MODEL: 8000A equivalent) may be used to make the hot checks.

Leakage current must not exceed 0.5 milliamp.

In case a measurement is out side of the limits specified, there is a possibility of a shock hazard, and corrective action must be taken before returning the instrument to the customer.

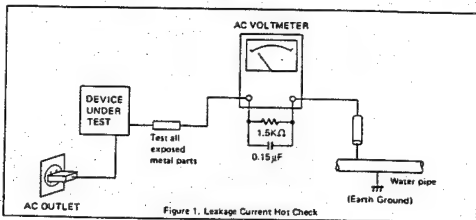


Figure 1. Leakage Current Hot Check

BOSCH-BAUER

VCC820AF

Service Manual

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CHAPTER I. GENERAL DESCRIPTION OF PRODUCT

1. Product Overview

The Model E30E.F, developed as a successor to E80E.F, provides impressive combination of the new features - double function keys, dual beam autofocusing, automatic backlight correction - with the inherited features of "Flexigrip" and power-on full automatic system.

1-1 Major features

1) Excellent picture quality

- * High-performance 6x power zoom lens
- * Flying erase head
- * Full-auto white balancing (TTL)
- * Center-emphasis averaging photometry

2) Functionalities

- * Near-infrared dual beam autofocusing
- * High-speed search (SP: 14 x fast motion, LP: 28 x fast motion)
- * Linear time counter
- * Video-audio synchronous fading
- * Auto date/title character generation
- * Self interval timer

3) Operabilities

- * EVF built-in rotary "Flexigrip"
- * Wireless controller (WL-400) provided
- * Double function keys
- * Recording search
- * Recording reminder (10-sec counter)

1-2 Major characteristics of each section

Table I-1 shows the major characteristics of each section in Model E30E.F.

Table I-1

Lens	Camera			Recorder			GRIP circuit
	AF circuit	CCD	Sensor process circuit	Video circuit	Syscon-servo circuit	Mechanism	
6x tele-macro lensing facility (new design)	Without AI micro-computer incorporated in E640E.F	320,000 pixels (Effective pixels: 300,000) (new design)	Equivalent to that of E80E.F series Y/C process circuit (IC2203) (new design)	Equivalent to that of E80E.F series	Equivalent to that of E80E.F series	MC-4B two heads, plus flying erase head	Same as that of E640E.F

1-3 Nomenclature

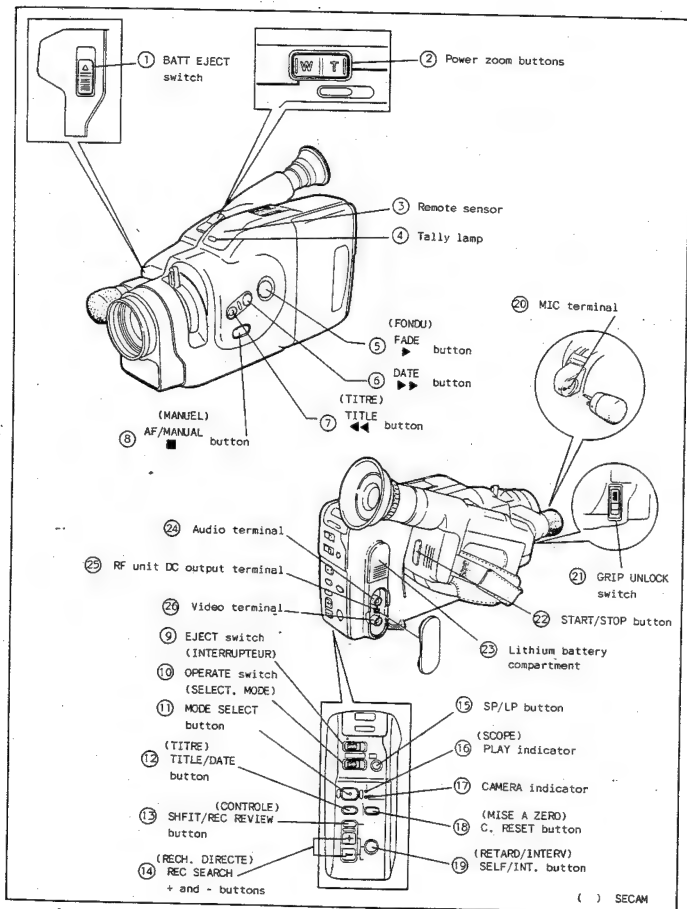


Fig. 1-1

1-4 Brief explanation of control buttons and terminals

- ① **BATT EJECT switch**
Slid this switch when taking the battery from the battery box.
- ② **Power zoom buttons [W/T]**
By pressing these buttons, an angle of view is zoomed in/out to wide/telephoto direction.
- ③ **Remote sensor**
The remote control signal is received through this window.
- ④ **Tally lamp**
This lamp flashes during the recording, self-timer or the interval timer operations. Also, it lights up when the remote control signal is received.

Recording flashes at 1Hz
Self-timer ON: 0.5sec. OFF: 1.5sec
Interval timer ON: 0.5sec. OFF: 1.5sec
Remote controller used lights up

⑤, ⑥, ⑦ and ⑧ buttons

According to modes, CAMERA MODE/PLAY MODE, buttons ⑤, ⑥, ⑦ and ⑧ function in two ways, respectively as follows. For selecting CAMERA MODE/PLAY MODE, push ⑪ MODE SELECT button.

⑤ FADE button

CAMERA MODE: FADE button [FADE] (FONDU)

When this button is pressed and held on for 4 minutes or more, the picture and sound disappear gradually (fading out). By releasing, they appear gradually (fading-in). The fading is not interlinked with the trigger button.

PLAY MODE : PLAY button [▶]

Pressing this button starts playback operation.

⑥ DATE button

CAMERA MODE: DATE button [DATE]

Pressing this button in camera mode presents the date/time indication on the viewfinder screen. In camera recording, the date/time can be imposed on pictures.

Date/time not displayed (At power-on) → 1. JAN. 1990 (Only date displayed) → Date/time not displayed (Only time displayed) → 12:34 AM (Date and time displayed) → Date/time not displayed (Date and time displayed) → 12:34 AM (Date and time displayed)

PLAY MODE : FAST FORWARD button [▶▶]

Pressing this button in the pause state causes the tape to be fed fast. If it is held down during playback, the pictures are played back rapidly (at a speed of 9 x fast motion). When it is released, the machine resumes normal playback operation. Also, if this button is held down for fast-forward operation, the fast-forward playback operation (SP: 14 x fast motion, LP: 28 x fast motion) is continued.

⑦ **TITLE** button

CAMERA MODE: Title button [TITLE] (TITRE)

Pressing this button in the camera mode presents the memorized title on the viewfinder screen. In the camera recording, the user-created title can be imposed on pictures.

PLAY MODE: Rewind button [◀◀]

Pressing this button in stop mode rewinds the tape. And, holding down this button in the playback mode reproduces the fast-motion pictures (7 x fast motion). In the playback mode, releasing this button causes the machine to perform normal playback again. Also, if it is held down during tape rewinding, the pictures are played back backward rapidly as the tape goes back (SP: 14 x fast motion, LP: 28 x fast motion).

⑧ **AF/MANUAL** button

CAMERA MODE: AF/MANUAL button [AF/MANUAL]

When pressed in camera mode, auto focusing and manual focusing are selected alternately. In manual focusing mode, "M. FOCUS" appears in the EVF. Immediately after the power turned on, AF mode is set automatically.

PLAY MODE: Stop button [■]

Pressing this button causes tape drive to stop.

⑨ **EJECT** switch [▲ EJECT]

In other than the recording mode, pressing this switch eject the cassette tape.

⑩ **OPERATE** switch [OPERATE] (INTERRUPTEUR)

Used to turn power on/off.

⑪ **MODE SELECT** button [MODE SELECT] (SELECT MODE)

By pressing this button, buttons from ⑤ through ⑧ can be functioned in two ways respectively. Whenever the power switch is turned on, it is set to CAMERA mode automatically. (See the explanation of ⑤ through ⑧ above.)

⑫ **TITLE/DATE** button [TITLE/DATE] (TITRE/DATE)

By pressing this button once, the title mode is set. Then, by manipulating the plus/minus and the SHIFT buttons, the title can be created. On completion of the title making, press the title/date button again. This stops the blinking of title.

When this button is pressed for more than 3 seconds, "years, months, days/hours, minutes" mode is set. By manipulating each button, the displayed prompt can be changed.

⑬ **SHIFT/REC REVIEW** button [SHIFT-REC REVIEW] (SHIFT-CONTROLE)

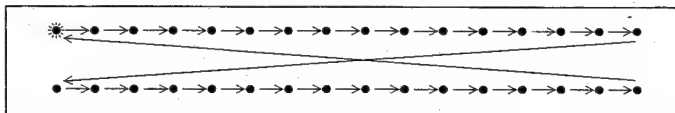
Used for setting the auto date function.

Each press of this button shifts the prompt from "years" to "months", "days", "hours" and "minutes".

			(No. denotes the time of pushing.)
④	⑤	④	⑥ all indication lights up.
③	②	①	

*blinks

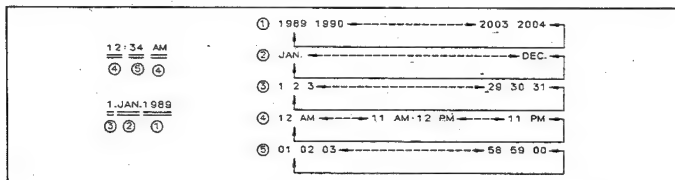
Used for shifting the character position of title (16 characters on 2 lines)



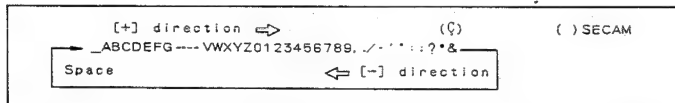
In the recording pause mode, by pressing of this button the previous recording for approx. 3 seconds is played back to allow the user to check it.

⑭ REC SEARCH/+ and - buttons [REC SEARCH] (REC. DIRECTE)

* Any setting is allowed for the auto date function (years, months, days, hours, minutes).



* Usable for selection of alphanumeric character/special symbol in title.



* In recording pause state, by pressing and holding down the + button, the tape is played forward, and by pressing and holding down the - button, the tape is played backward. By releasing these buttons, the recording pause mode enters again.

* Selection of timer recording mode

When the [+] button pressed at timer recording mode, the cursor (→) advances, and it returns by pressing the [-] button from the timer mode setting.

⑮ SP/LP button [SP/LP]

SP or LP recording mode is selectable at REC PAUSE FF, REW or STOP mode.

⑯ PLAY indicator [PLAY] (SCOPE)

Lights up in PLAY mode. Also, it blinks for warning when an insufficient power, a dew condensation, etc. are detected.

⑰ CAMERA indicator [CAMERA]

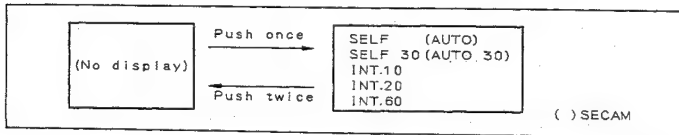
Lights up in CAMERA mode. Also, it blinks for warning when an insufficient power, a dew condensation, etc. are detected.

⑮ C. RESET button [C. RESET] (MISE A ZERO)

In any mode, pressing this button causes the linear tape counter to be reset to 0:00:00.

⑯ SELF/INT. button [SELF/INT.] (RETARD/INTERV)

By pressing this button once in the recording pause mode, "Self-Interval" indication is displayed on viewfinder screen. For releasing, push the button again.



⑰ MIC terminal [MIC]

Used as a terminal for the regular microphone and the external monaural microphone.

⑱ GRIP UNLOCK switch [GRIP UNLOCK]

By pressing and holding down this button, the grip can be rotated.
The grip is fixed by releasing this button.

⑳ START/STOP button

Pressing this button in the recording pause state causes the machine to resume recording. When this button is pressed again, the recording pause state is set up again.
This button is also usable to start/cancel the self/interval timer function.
Pressing this button during playback causes the machine to go to the still playback mode. When this button is pressed in the still playback mode, the machine goes back to the normal playback mode.

㉑ Lithium battery compartment

Contains the lithium battery for auto date function. The lithium battery has a service life of approx. one year.

㉒ Audio terminal

Output terminal for audio signal.

㉓ RF unit DC output terminal

Used for power supply (+5 V) terminal when connected with the RF unit (RU-E3).

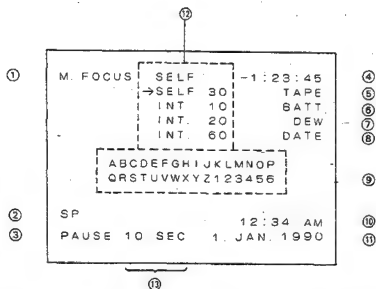
㉔ Video terminal

Output terminals for video signal.

1-5 Information display on electronic viewfinder (EVF)

Press ON SCREEN button on wireless controller to see viewfinder displays ③ and ④ on a connected TV screen.

* Only title, date and time are recorded with scenes.



(): SECAM

No.	Mode	Display	Description
①	Focus Camera/Play	No display M. FOCUS (MANUEL) No display PLAY (SCOPE) MODE	Autofocus Manual focus Camera operation Playback operation
②	Tape Speed	SP LP	Standard play Long play
③	Operation	PAUSE REC (ENR) PLAY (LECT.) STILL (ARRET) STOP FF (AVAN.) REW (RET.) EJECT EJECT [flashes]	Record pause Recording Normal playback fast forward playback or rewind playback Still playback Stop Fast forward or fast forward search Rewind or rewind search Eject function is operated Safety mechanism functions
④	Tape Counter	- 4:16:59 to 4:16:59	Tape counter reading
⑤	Tape Status	TAPE [flashes] T.END (BANDE)	No cassette is loaded or an unrecordable cassette is loaded Tape reaches the end
⑥	Battery Warning	BATT [flashes]	Battery charge is nearly exhausted

No.	Mode	Display	Description
⑦	Condensation Warning	DEW [flashes] (COND)	Condensation is detected in camera
⑧	Lithium Battery Warning	DATE [flashes]	Lithium battery charge is low or no battery is inserted
⑨	Title	2 lines x 16 characters	Alphabet (A-Z), numerals (0-9), and 12 symbols
⑩	Time	12:00 AM to 11:59 PM	Present time
⑪	Date	1. JAN. 1989 to 31. DEC. 2004	Current date
⑫	Timer Recording Menu	→ SELF SELF 30 INT.10 INT.20 INT.60	→ Arrow indicates selected mode
⑬	Timer Recording	0SEC — 10SEC 10SEC — 1SEC 30SEC — 1SEC INT.10 INT.20 INT.60	Recording reminder Self timer countdown Self 30 recording 10 sec. interval timer 20 sec. interval timer 60 sec. interval timer

1-6 E30 system chart

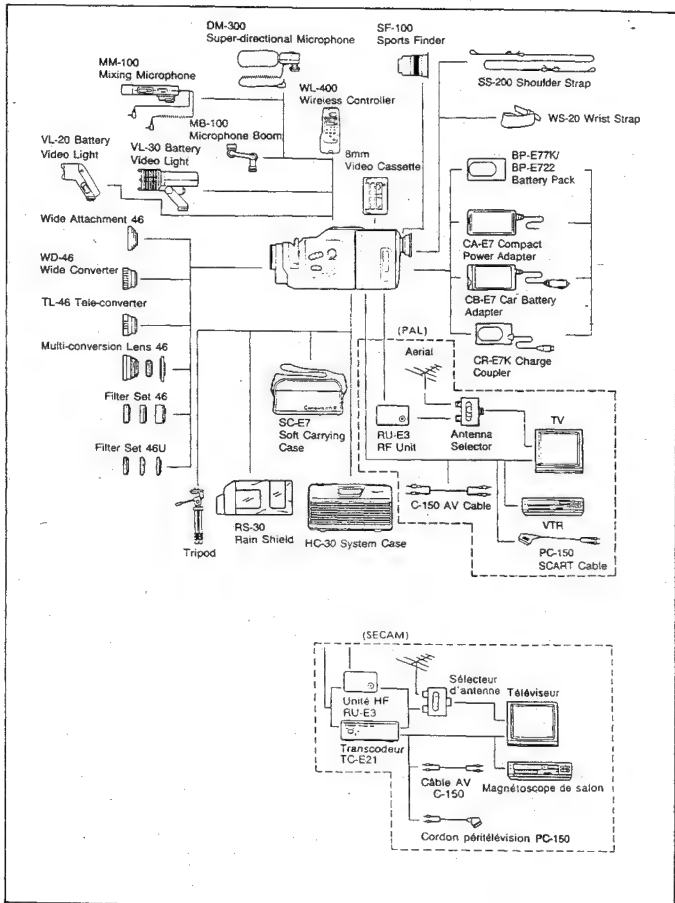


Fig. I-2

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8.	Mechanical Adjustment of Recorder Section	II - 30

CHAPTER II. DISASSEMBLING/ADJUSTMENTS

1. List of maintenance tools and supplies

1-1 Maintenance tools

DESCRIPTION	TOOL NO.	REMARKS
Alignment tape E (MONOSCO)	DY9-1062-000	(A1E,F) New
Alignment tape G (V DO Master)	DY9-1064-000	
Recording current checker	DY9-1056-000	
Y/C mix amplifier	DY9-1079-000	
Extension connector kit	DY9-1092-500	
Extension connector kit	DY9-1102-000	
Color bar chart	DY9-2002-000	
Logarithmic gray scale chart	DY9-2005-000	
Adjuster (2.6 mm)	DY9-2021-000	
Phillips screwdriver (bit part only)	DY9-2030-000	
Adjuster (1.8 mm)	DY9-2041-000	EUROPE, H.K. etc. U.K.
Color viewer (5600°K)	DY9-2039-500-220	
	DY9-2039-500-240	
Color viewer lamp (5600°K)	DY9-2040-000	
ND-2.0 filter (100 x 100 mm)	DY9-2044-000	

Supplies

DESCRIPTION	TOOL NO.	REMARKS
Screw lock 1401C	CY9-8011-000	
Alonalpha	CY9-8007-000	
Grease GE-C9	CY9-8043-000	
Grease GE-X8	CY9-8044-000	
Grease GE-C4	CY9-8045-000	
Teflon Fluorocarbon Resin MP-102	DY9-3013-000	
Floil G902	DY9-3017-000	

Note: For recorder mechanism, refer to the mechanism manual MC-4B (DY8-3391-501 201) separately issued.

1-2 List of extension connectors

Use the following extension connectors.

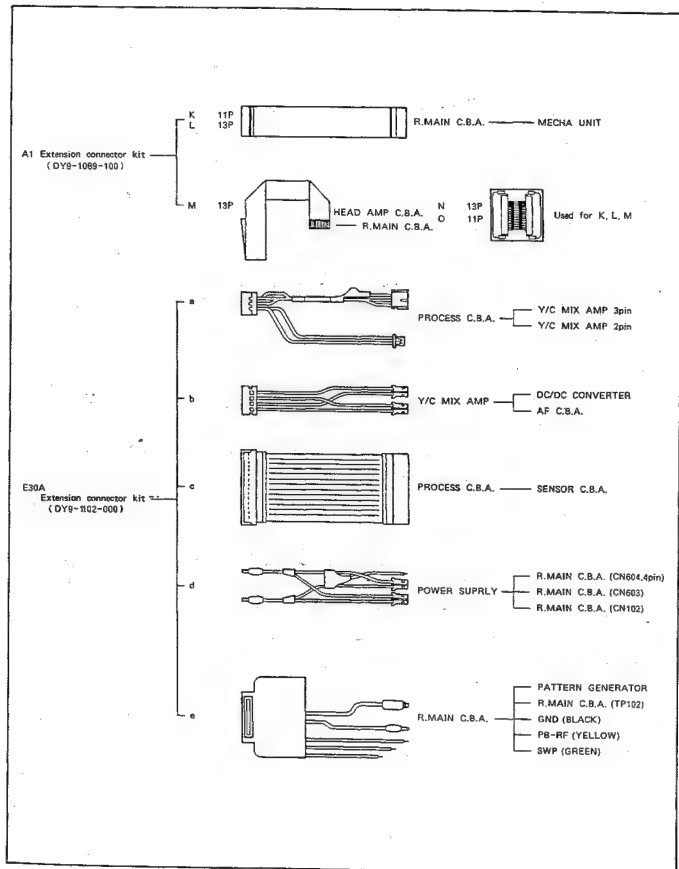


Fig. 11-1

2. Disassembling

2-1 Removal/reassembling of covers

2-1-1 Removal of finder assembly, EVF ring, microphone, AV cap and battery cover

- (1) Detach the finder assembly, EVF ring, the microphone, the AV cap and the lithium battery cover.

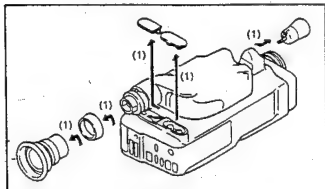


Fig. II-2

2-1-2 Removal of cassette cover

- (1) To remove two screws (a), peel off two cassette cover seals.
- (2) Detach the cassette cover.

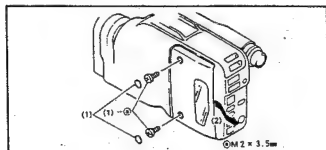


Fig. II-3

2-1-3 Removal of left grip cover

- (1) To remove two screws (b) of the rear side, turn the grip downward by 90°.
- (2) Remove two screws (b) of the front side.
- (3) Detach the left grip cover.

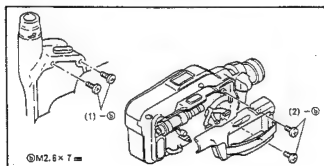


Fig. II-4

2-1-4 Removal of lens cover

- (1) Remove two screws (c) and (d).

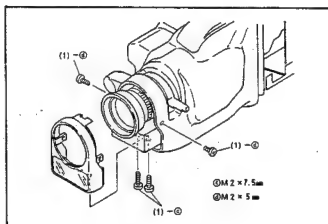


Fig. II-5

* Note: After replacing a lens cover, be sure to perform 4-2 AF distance measurement adjustment.

2-1-5 Removal of left cover

- (1) Remove a screw (e).
- (2) To remove a screw (f), turn the grip a little as shown in the figure.
- (3) Remove four screws (d), two screws (g) and a screw (i).
- (4) Unplug four connectors between the GRIP C.B.A. and the main unit.
- (5) While pulling out the connectors unplugged in the step (4) from the hole of the grip, detach the left cover.

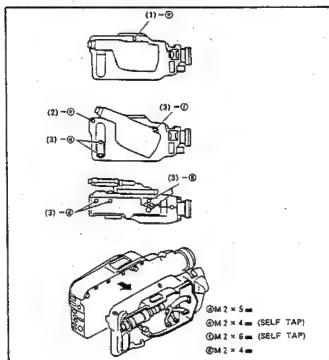


Fig. II-6

2-1-6 Removal of top/right covers

- (1) Remove three screws (e).
 - (2) Take out the top cover.
- * Note: Be careful not to damage the claws when detaching/reassembling.
- (3) Take out the right cover.

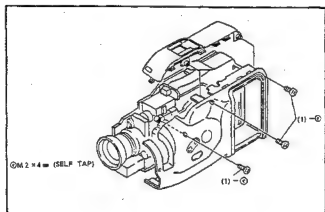


Fig. II-7

2-1-7 Removal of camera and lens units

- (1) Unplug connectors between the camera and the recorder units. (CN4005, CN4006)

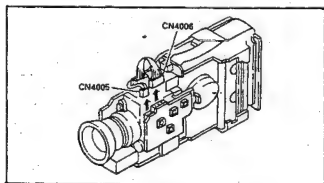


Fig. II-8

- (2) While lifting up, detach the camera unit.
- (3) Unplug the connectors between the camera and the recorder units. (CN2001)

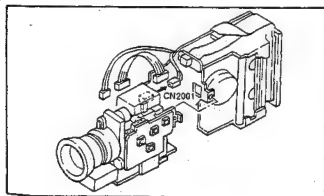


Fig. II-9

2-1-8 Removal of GRIP C.B.A.

- (1) Remove three screws (h).
- (2) Take out the GRIP C.B.A.

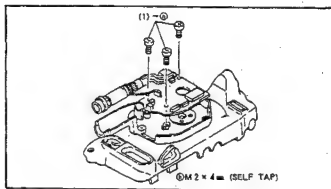


Fig. II-10

2-1-9 Removal of grip right cover

- (1) Remove three screws (i).
- (2) Detach the grip right cover.

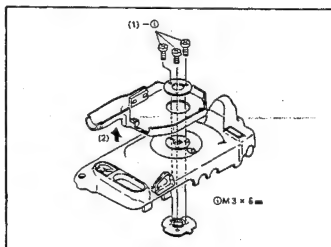


Fig. II-11

CHAPTER II. DISASSEMBLING

1. Disassembling of Camera Section

1-1 Removal of camera holder (2) and PROCESS C.B.A.

- (1) To detach the camera holder (2), remove two screws (J).
- (2) Detach the PROCESS C.B.A.
- (3) Unplug the connectors between the lens unit and the PROCESS C.B.A. (x1)

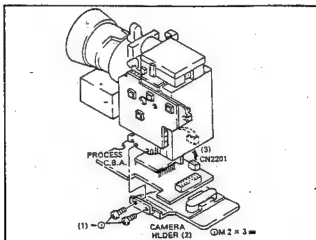


Fig. II-1

1-2 Removal of PROCESS SHIELD and DC/DC converter

- (1) Remove a screw (K).
- (2) Detach the PROCESS SHIELD.
- (3) To detach the DC/DC converter, unhook the claw (A).

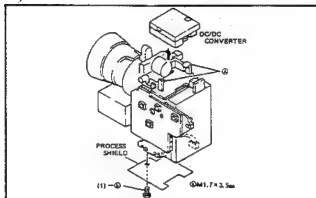


Fig. II-2

1-3 Removal of AF C.B.A.

- (1) Remove a screw (N).
- (2) Detach the AF C.B.A.
- (3) Unplug connectors between the lens unit and the AF C.B.A. (CN4001, CN4002, CN4003, CN4004)

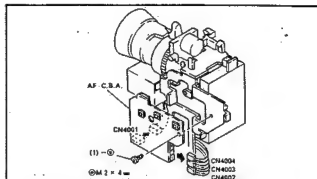


Fig. II-3

1-4 Separation of SENSOR C.B.A., CGD and lens unit

- (1) To detach the shield case 2, unsolder the three parts (A) of the shield case.
- (2) Remove two screws (1) and two screws (B).
- (3) Detach the lens unit.
- (4) Unsolder the pins of CCD.
- (5) To detach the SENSOR C.B.A., remove two screws (J).
- (6) To detach the CCD, remove two screws (1).

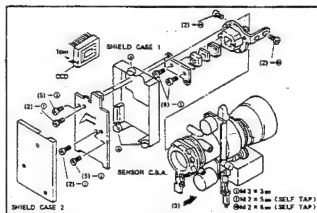


Fig. II-4

1-5 Removal of DC/DC holder

- (1) Remove a screws (J).
- (2) Detach the DC/DC holder.

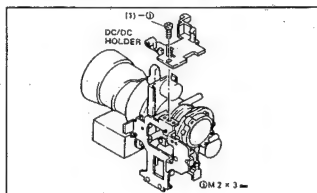


Fig. II-5

2. Disassembling of Lens Section

2-1 Removal of camera holder

- (1) Remove two screws (c).
- (2) Detach the camera holder.

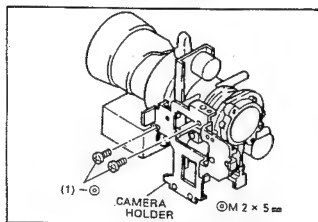


Fig. II-6

2-2 Removal of AF, PZ motors and HOLDER PCB

- (1) Remove a screw (m).
- (2) Detach the HOLDER PCB.
- (3) Remove two screws (p).
- (4) Detach the AF and PZ motors.

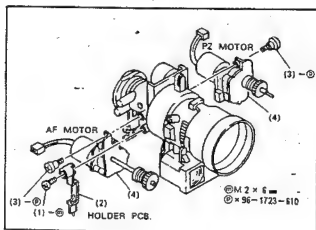


Fig. II-7

2-3 Removal of AF block

- (1) Remove two screws (q).
- (2) Detach the AF block.

* Notes: 1. When remounting the AF block, make sure that the focusing ring cam surface (A) is interlocked with the prism arm B properly.
2. Do not loosen the screws securing the SPC and IRED C.B.A.s.
3. After remounting the AF block, be sure to perform the AF distance measuring adjustment (4-2).

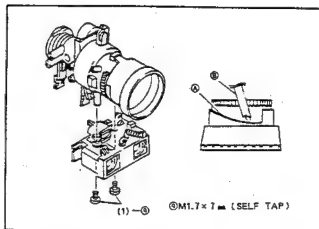


Fig. II-8

2-4 Removal of relay lens assembly

- (1) Remove a screw (r).
- (2) Detach the relay lens assembly.

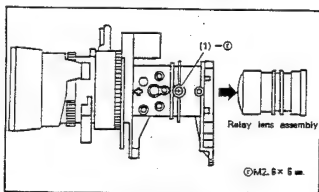


Fig. II-9

2-5 Removal of IG meter assembly

- (1) Remove a screw (s).
- (2) Detach the IG meter downward.

*Note: When detaching/attaching, be careful not to deform the diaphragm blades. As the diaphragm blades are likely to come off from the dowel, check that they are secured completely.

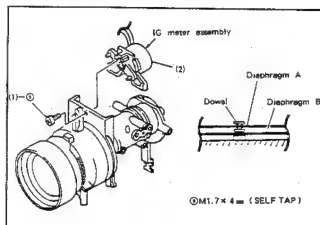


Fig. II-10

2-6 Removal of diaphragm blades A and B

- (1) Remove the IG meter.
- (2) Align the part (a) of diaphragm blade A with its dowel position, and then detach the diaphragm blade A.
- (3) Also, detach the diaphragm blade B in the same manner.

* Notes: 1. Be extremely careful not to bend or contaminate the diaphragm blades. Also, do not touch them with bare hand or fingers.
2. The ND filter is in the blade A.

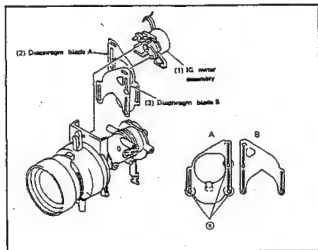


Fig. II-11

2-7 Removal of zoom sheet

- (1) Peel off the zoom sheet with a pair of tweezers or the like.

* Note: When reattaching the zoom sheet, take care not to crease or kink it.

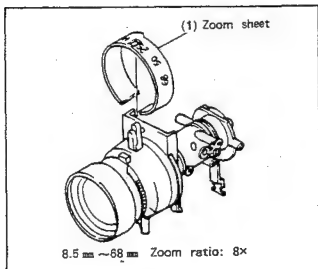


Fig. II-12

2-8 Separation of zoom section

- (1) To detach the N stopper, remove a screw (t).
- (2) Dismount the focus lens assembly.
- (3) Remove three screws (U) with the relay holder (D) and the fixed lens barrel (A) connected.
- (4) Turn the focus side up.
- (5) Set the zoom ring to the telephoto-end position. Then, pull up the fixed lens barrel (A) straight gradually.

* Notes: 1. The cam ring (C) and the zoom ring (B) are detached when the fixed lens barrel (A) is pulled up straight.

2. The three guide bars and a spring are still installed into the relay holder (D) at this state.

- (6) Align the depression of fixed lens barrel A and the projection of zoom lever (B) (inside). Then, pull up the fixed lens barrel (A) straight.
- (7) Detach the projection of zoom ring (B) (inside) from the cam ring (C). Then, pull up the zoom ring (B) straight.
- (8) Remove two screws (V).

* Note: When reassembling, check the size of screws.

- (9) Pull up the cam ring (C) straight.

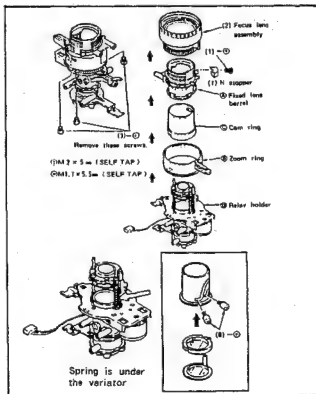


Fig. II-13

2-9 Reassembling of zoom ring

- (1) Install a compensator lens (E) to a relay holder (D), and then a variator lens (F) to it.

- (2) Put the cam ring on the relay holder. Then secure them with two screws (V).

* Note: Check that the plate springs are positioned properly.

- (3) Install the zoom ring while engaging the claw of zoom ring with the cam ring.

- (4) Mount the fixed lens barrel.

* Note: When mounting, set the zoom ring at the telephoto-end position. Also, set three zoom bars into the holes of fixed lens barrel completely.

- (5) Secure the relay holder and the fixed lens barrel with three screws (U).

- (6) Mount the focus lens assembly. Then, secure the N stopper with a screw (T).

- (7) Perform the operational checks and the AF distance measuring adjustment.

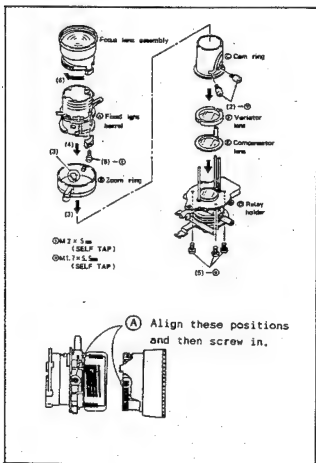


Fig. II-14

2-10 Oil/grease/bond application positions

After cleaning, replacement, etc., apply the followings to the indicated positions in the Fig. II-15.

- ① Grease GE-X8 (CY9-8044-000)
- ② Grease GE-C4 (CY9-8045-000)
- ③ Instantaneous adhesive Alonalpha (CY9-8007-000)
- ④ Floil G902 (DY9-3017-000)
- ⑤ Use the above MP-102 with GE-C4.

Weight ratio is as follows.

MP-102 : GE-C4

3 : 10

Teflon Fluorocarbon Resin MP-102

(DY2-3013-000)

Grease GE-C4 (CY9-8045-000)

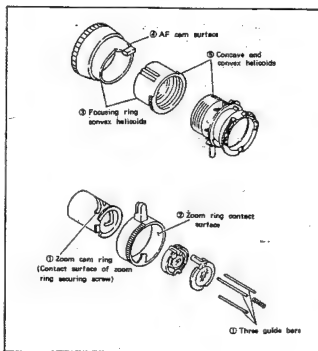


Fig. II-15

2-4 Disassembling of recorder section

2-4-1 Removal of RECORDER-MAIN, RECORDER-KEY and REMOCON C.B.A.s

- (1) Remove a screw (j).
- (2) Unplug CN003 of RECORDER-KEY C.B.A.
- (3) To detach the RECORDER-KEY C.B.A., open the C.B.A., and unplug CN001 and 002.

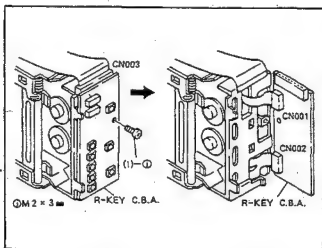


Fig. II-27

- (4) Unplug connectors between the R.MAIN C.B.A. and the Recorder unit. (CN403, CN606, CN402, CN605, CN607)

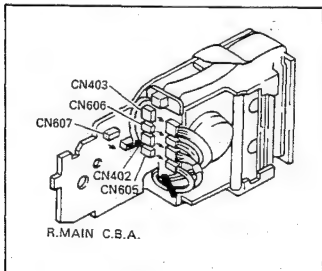


Fig. II-28

- (5) To open the R.MAIN C.B.A., remove two screws (i).
- (6) Unplug a connector between the R.MAIN C.B.A. and the Recorder unit. (CN301)
- (7) To detach the REMOCON C.B.A., remove a screw (j).

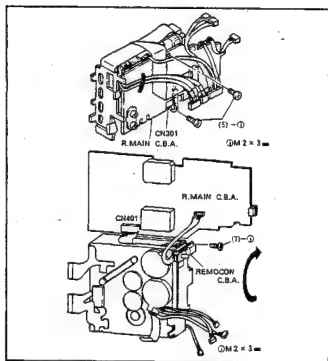


Fig. II-29

2-4-2 Removal of recorder holders A and B

- (1) Unplug the capstan connector.
- (2) Remove two screws (w), one screw (x) and two screws (i).
- (3) Detach the recorder holders A and B.

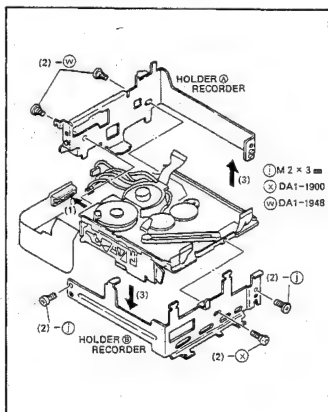


Fig. II-30

2-5 Wirings

(1) RECORDER-MAIN C.B.A.

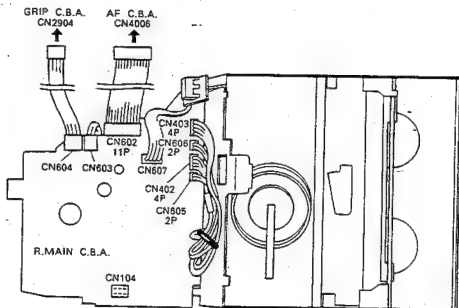
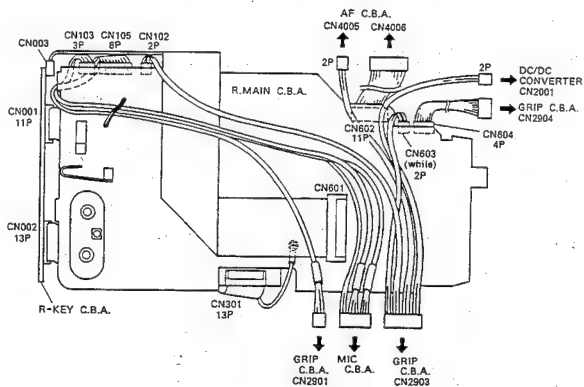


Fig. II-31

(2) GRIP C.B.A.

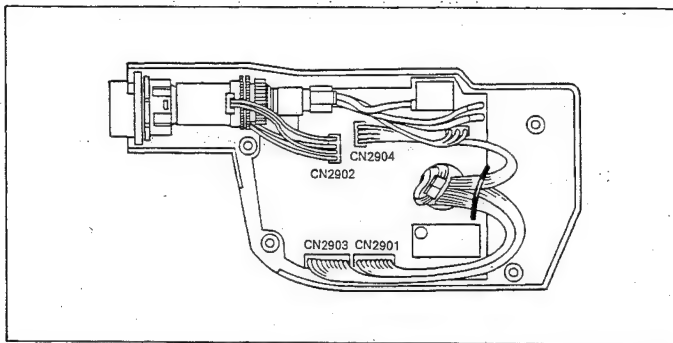


Fig. II-32

3. Before Adjusting

3-1 Preparation for camera section adjustments

3-1-1 Setting

* Preparation

- * Y/C mix amplifier (DY9-1079-000)
- * Extension connector kit (DY9-1102-000)
- * Constant voltage supplier (6 V)

- For camera electrical adjustment -

Procedures:

- (1) Connect a Y/C Mix Amplifier by using extension connectors a and b.

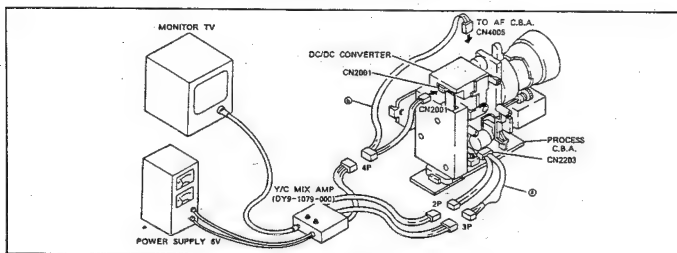


Fig. II-33

- (2) Preparation for camera adjustment (setting of charts/unit)

- 1) Detach the camera holder (2).
- 2) Set the camera unit in front of the chart with both the unit and the chart upside down.

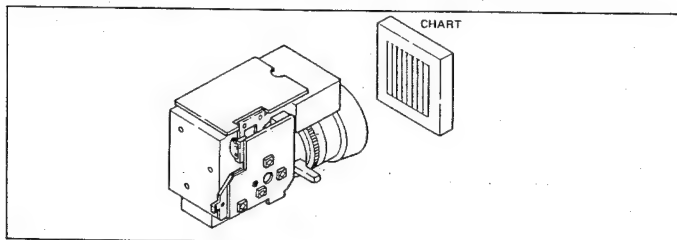


Fig. II-34

- (3) AF check (camera unit only)

- * Short-circuit the followings on the AF C.B.A. to check the AF function by using a camera unit independently.

- | | | |
|-------------------------|---|------------------------------|
| CN4005 1 pin (UNREG 6V) | ↔ | CN4006 1 pin (CAMERA ON (H)) |
| 2 pin (GND) | ↔ | 2 pin (AF ON (L)) |

3-1-2 How to open C.B.A.s of camera section

Procedures:

- (1) Remove two screws securing the camera holder 2.
- (2) Detach the camera holder 2, and disconnect the PROCESS C.B.A.
- (3) Connect the PROCESS C.B.A. and the SENSOR C.B.A. with an extension connector c.

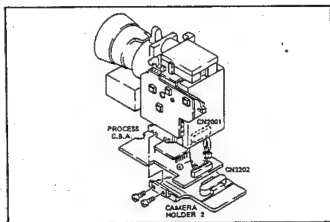


Fig. II-35

3-1-3 Chart for adjustment

- (1) Fixture (attached to Service Manual for A1A)

Used for the blooming adjustment. Set the fixture onto the front face of lens, and attach each filter.

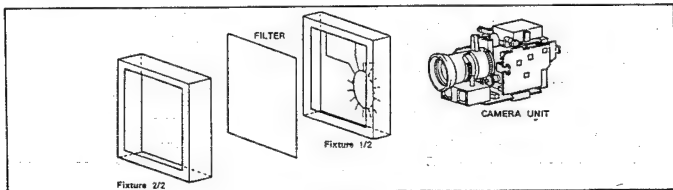


Fig. II-36

- (2) U-chart

- 1) Prepare by cutting a U-pattern off from the center of black paper. Size is detailed in the Fig. II-37.
- 2) X marks indicate the standard picture frame.

* Note: For the blooming adjustment, attach a piece of white paper onto the rear side.

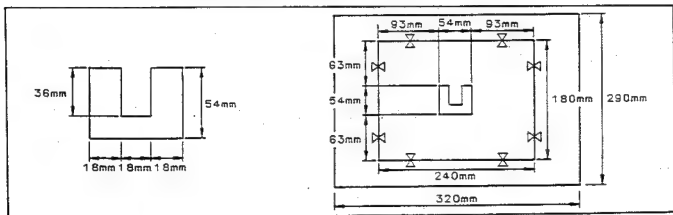


Fig. II-37

3-1-4 Other precautions

- (1) Prior to adjustment, energize the equipment for 3 minutes or longer.
 - (2) Set the light box at color temperature 5600°K.
 - (3) "Standard angle of view"
- * The "standard angle of view" is given when the charts displayed so as to meet the maximum screen of the full scan monitor.
 - * With an oscilloscope, adjust the grayscale (36 μ s) and the color bar (52 μ s), followed by shooting.
 - * Shoot the white chart at its center.
 - * Unless otherwise specified, shooting distance must be about 1.4 m.

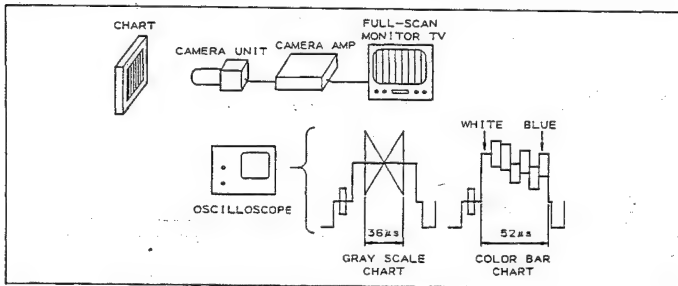


Fig. II-38

3) - For tape transport adjustment -

Procedures:

- (1) Set up the state explained in the 1 or 2 "- For the recorder adjustment I or II -".
- (2) By using an input connector e, pick up GND, PB-RF and SWP signals for each adjustment.

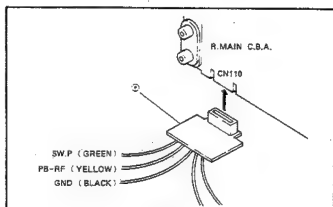


Fig. II-41

3-2-2 How to open C.B.A.s of recorder section

1) R-KEY C.B.A.

Procedure:

- (1) Open the R-KEY C.B.A. with extension connectors K, L, N and O.

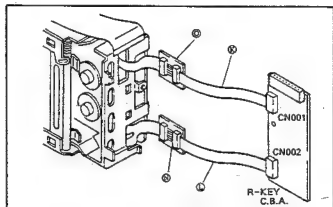


Fig. II-42

2) R.MAIN C.B.A.

Procedures:

- (1) Remove two screws securing the R.MAIN C.B.A. and CND01.
- (2) Remove a screw securing the REMOCON C.B.A.
Take out the C.B.A. from the recorder unit.
- (3) Connect CND03 and the R-KEY C.B.A.
Then, open the C.B.A. with the following connectors.

K: T-reel extension cable (11p)

L: S-reel extension cable (13p)

M: Drum extension cable (13p)

N: L, M connector

0: K connector

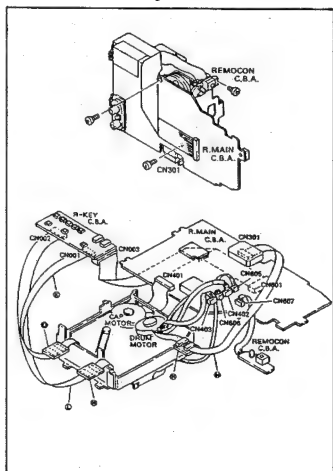


Fig. II-43

3-2-3 Service modes

Service modes are provided for adjustments/operation checks. Activate each mode with the recorder and the EVF connected for the purpose of character display.

(1) Transition to service modes

Mode is switched over when the pattern of wireless remote controller (WL-100, WL-200, WL-400) is shorted.

NORMAL → S-01 → S-02 → S-1 → S-2 →
→ NORMAL

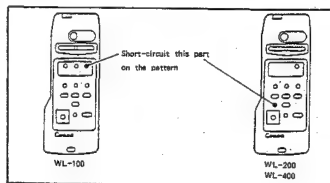


Fig. II-44

(3) Function of service mode

[S-01, S-02] (for tape transport adjustment) * Refer to the MC-4B Service Manual.

In this mode, no information character is displayed on EVF screen. Instead, POWER LED lamp flashes at certain interval of seconds.

* S-01 100% tracking, 220° envelope output mode

Power LED lamp flashes in every 1 sec.

* S-02 70% tracking, 220° envelope output mode

Power LED lamp flashes in every 2 sec.

[S-1] (for electrical adjustment, A/D converter data)

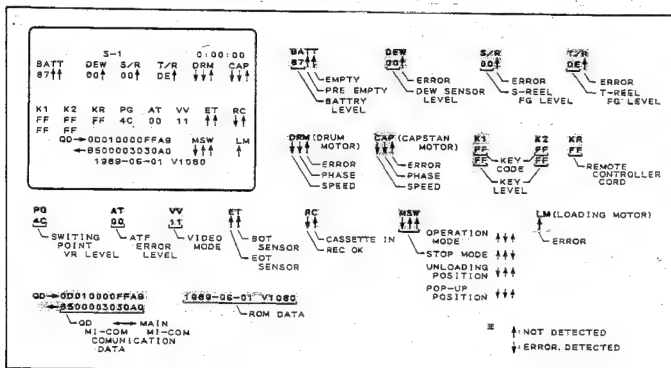


Fig. II-45

[S-2] (for cancelling error detecting functions)

The error detecting functions (drum rotation, capstan rotation and reel rotation) are cancelled.

4. Adjustments (Lens Section)

4-1 Back focus adjustment (T/W zoom correction)

CHART	Siemens chart located 3 m away
M. EQ.	Monitor TV
TOOL	Phillips screwdriver
ADJ.	Focusing ring, relay lens

* Note: Open the aperture fully as possible.

- (1) Loosen the screw (a).
- (2) With the telephoto-end zoom setting, bring the pattern image into focus by turning the focusing ring.
- (3) With the wide angle end zoom setting, bring the pattern image into focus by moving the relay lens back and forth.
- (4) Repeat the above steps (2) and (3) to remove defocusing at the telephoto and wide angle ends.
- (5) Tighten the screw (a).

* Note: When tightening, be careful not to shift the relay lens from the correct position.

- (6) Check the AF distance measuring function.

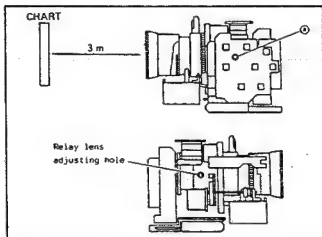


Fig. II-46

4-2 AF distance measurement adjustment

CHART	Siemens chart, 60% or higher reflectance chart.
M. EQ.	Monitor TV
TOOL	Hexagonal key wrench (1.27 mm), section paper, index strip
ADJ.	AF distance adjusting screw (a)
SPEC.	+0.75 mm, -1.0 mm (+: Infinity side)

* Note: Open the aperture fully as possible.

- (1) Attach the section paper and the index strip as shown in the Fig. II-47.
- (2) Shoot the Siemens chart from 3 m away.

- (3) With the telephoto end setting, bring the chart image into best focus. Then, mark the relevant index position on the section paper.
- (4) Replace the Siemens chart with the 60% or higher reflectance chart.
- (5) Mark the center AF stop position between the infinity and the closest ends on the section paper.
- (6) Check a difference between the positions marked at the steps (3) and (5) is within the specified range.
- (7) If not, adjust it by turning the hexagonal screw (a).

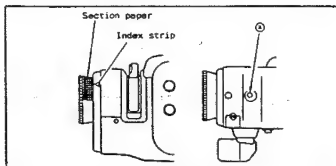


Fig. II-47

4-3 Preparation for lens focus adjustment

* Note: For this adjustment, pick up an actual scene at infinity (65 m or more away), or use a collimator.

Described below is the preparatory procedures by using the single-lens reflex camera and the lens (focal length: 300 mm or more recommended) in stead of a collimator.

CHART	Ground glass (30 mm x 40 mm, approx.)
TOOL	Single-lens reflex camera, lens (focal length: 200 mm or more), magnifier

- (1) Open the aperture of single-lens reflex camera fully. Then, open the rear lid.

* Note: If the shutter equips the valve mechanism, lock it for opening the aperture. If not (e.g. Canon T series, etc.), open the aperture by using the slow shutter and take out the internal battery immediately while the shutter is opened.

- (2) Secure the ground glass to the inside rail face by pressing it. At this step, the ground surface should face the lens side.
- (3) Shoot a scene at infinity. To check if it is in best focus, enlarge the image on the ground glass by a magnifier.

* Note: Distance for infinity: See the Fig. II-48.

- (4) After the above checking, remove the ground glass once and mark cross hair-lines on it. Then, attach it to the camera again.

* Remark: Using this substitute collimator, the back focus adjustment (T/W zoom correction) can be performed with high accuracy within a short time.

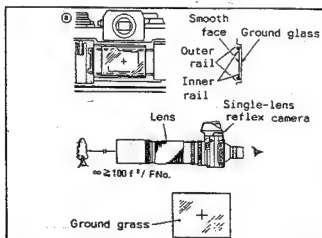


Fig. II-48

4-4 Lens focus adjustment

* Note: Perform this adjustment only when the focus lens assembly is replaced.

Described below is the adjustment procedures by using the single lens reflex camera instead of a collimator.

CHART	Ground glass (30 mm x 40 mm, approx.)
M. EQ.	Monitor TV
TOOL	Single-lens reflex camera, lens (focal length: 200 mm or more), phillips screwdriver
ADJ.	Focusing lens, relay lens
SPEC.	Within 1/3 of infinity mark (∞), (+0.5 mm)

- (1) Engage the concave helicoid with the focusing ring.
- (2) Remove the N stopper, and take out the focus lens assembly.

* Notes: 1. When reassembling, check the screwing-in starting position.
2. Do not exert undue force at screwing-in, or the thread may be damaged.
3. When reassembling, apply grease as specified.

- (3) Align the axis of main unit with that of the single-lens reflex camera as accurately as possible (visual alignment).

- (4) With the telephoto end zoom setting, adjust focus using the front lens. At this time, hold the focusing ring to the infinity (∞) stop position, and turn the concave helicoid until the best focus is obtained.
- (5) Loosen a screw (B).
- (6) Move the relay lens back and forth with the wide angle end to bring the image into best focus.
- (7) Repeat the steps (4) and (6) until the object is into best focus both in wide and telephoto ends.
- (8) Lock the relay lens and check that the object is in best focus.
- (9) Confirm that the focusing ring is butted onto the stopper at infinity side. Then, fix the focusing ring and the concave helicoid with an instantaneous adhesives specified. (Alonalpha)

* Notes: 1. Do not apply the adhesive excessively and also be careful not to drop it onto the other positions except indicated. (esp. AF cam part (D))
2. Do not touch forcibly for five minutes after application.

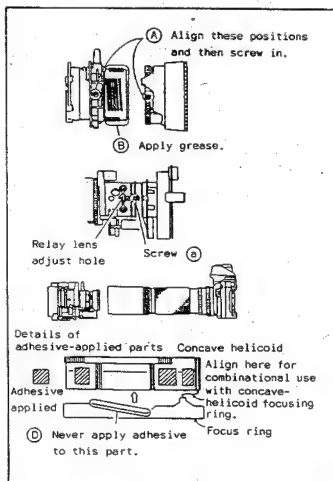


Fig. II-49

5. Electrical Adjustments (Camera Section)

* Note: For the following adjustments from 5-3 to 5-10, set the AWB PRESET mode. To set it, connect each TP as follows.

TP2654 (R-Y CONT) \leftrightarrow AWB C.B.A. 4P(+1.8V)
TP2655 (B-Y CONT) \leftrightarrow AWB C.B.A. 4P(+1.8V)

5-1 Clock frequency adjustment

M. EQ.	Frequency counter
	*Connect via oscilloscope
TP/TRIG.	PRO. C.B.A. CN2202 (18 PIN), TP2653 (GND)
ADJ.	SENS C.B.A. VC2001 (CLOCK)
SPEC.	4.828125 MHz \pm 0.000015 MHz

5-2 PLL adjustment

M. EQ.	Digital voltmeter
TP/TRIG.	TP2203 (PLL), TP2653 (GND)
ADJ.	SENS C.B.A. VC2202 (PLL)
SPEC.	2.5 \pm 0.1 V

5-3 Auto iris adjustment

* Note: After adjustment, move iris from lens-closed to opened to confirm the specification obtained.

CHART	Grayscale (5600°K)
MODE	AWB PRESET
M. EQ.	Oscilloscope
TP/TRIG.	TP2202 (Y IRIS), TP2204 (FH/2)
ADJ.	PRO C.B.A. VR2201 (IRIS)
SPEC.	300 \pm 10 mV

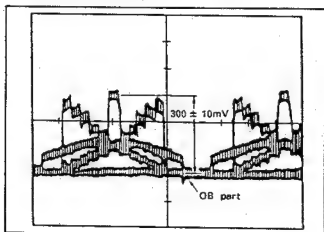


Fig. II-50

10 mV/10 μ s

5-4 OB set adjustment

CHART	Lens closed
MODE	AWB PRESET
M. EQ.	Oscilloscope
TP/TRIG.	TP2205 (Y AGC), TP2204 (FH/2)
ADJ.	PRO. C.B.A. VR2202 (OB SET)
SPEC.	Levels of waveform and blanking centers to be the same.

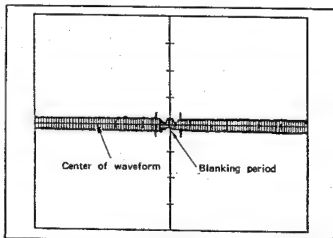


Fig. II-51

5 mV/10 μ s

5-5 Y level adjustment

* Note: Before adjustment, short-circuit TP2403 (W.CLIP) and TP2652 (+5V). Use the waveform having higher center peak.

CHART	Grayscale (5600°K)
MODE	AWB PRESET, TP2403 \leftrightarrow TP2652
M. EQ.	Oscilloscope
TP/TRIG.	TP2405 (Y OUT), TP2204 (FH/2)
ADJ.	VR2203 (AGC LEVEL)
SPEC.	1000 \pm 20 mV

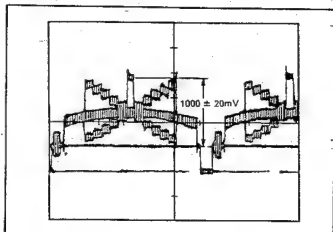


Fig. II-52

50 mV/10 μ s

5-6 1/2 ft color difference elimination

CHART	LENS CLOSED
MODE	AMB PRESET
M. EQ.	Oscilloscope
TP/TRIG.	CN2202 pin 21 (C. OH), TP2204 (FH/2)
ADJ.	VR2204 (FH/2 COMP)
SPEC.	0 ± 10 mV

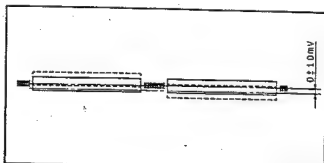


Fig. II-53 5 mV/10 μs

5-7 Color difference Gain/Modulation axis adjustments

CHART	Color bar (5600°K)
MODE	AMB PRESET
M. EQ.	Vectorscope
ADJ.	PRO CBA VR2207 (C1H LEVEL) PRO CBA VR2405 (BRUST ϕ) PRO CBA VC2401 (SC 90°)
SPEC.	* Overlay each bright dot Acceptable dot split: Phase 5° or less Gain 10% or less * Burst phase: $135 \pm 2^\circ$

- Notes:
1. Measure dot split according to Fig. II-54.
 2. Adjust R, Ye and G mainly.
 3. Both of two specification value (dot split/burst phase) must be obtained at the same time.

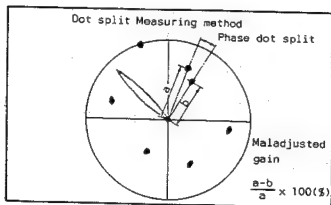


Fig. II-54

5-8 Carrier balance adjustment

CHART	Grayscale (see Fig. II-55) (5600°)
MODE	AMB PRESET
M. EQ.	Vectorscope
ADJ.	VR2403 (B-Y CB) VR2404 (R-Y CB)
SPEC.	Bright dot (dark part) to be centered

- * Notes:
1. Turn a zoom setting from the standard angle of view to a wide angle for the adjustment.
 2. If two dots are appeared, choose a dot in the dark part.

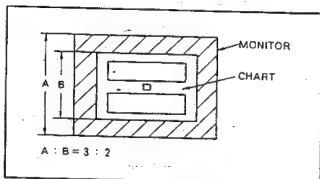


Fig. II-55

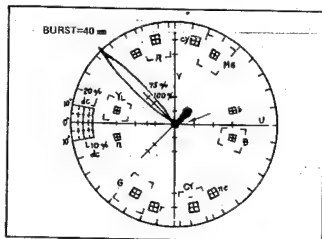


Fig. II-56

5-9 White balance adjustment

CHART	Grayscale
MODE	AMB PRESET
M. EQ.	Vectorscope
ADJ.	VR2205 (R WB), VR2206 (B WB)
SPEC.	Set bright dot at the center as possible.

5-10 Color balance adjustment

* Note: Adjust R's phase and gain mainly.

CHART	Color bar
MODE	AWB PRESET
M. EQ.	Vectorscope
ADJ.	VR2401 (B GAIN), VR2402 (R GAIN)
SPEC.	Color pshse Gain (burst ratio)
	R $102 \pm 4^\circ$ 1.5 ± 0.1 times
	Ye $166 \pm 6^\circ$ 1.0 ± 0.2 times
	G $242 \pm 10^\circ$ -

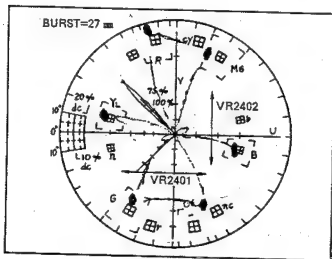


Fig. II-57

5-11 Full auto white balance adjustments 1
and 2

CHART	White chart
M. EQ.	Vectorscope
TOOL	Halogen lamp

* Full auto white balance adjustment 1

MODE	FAME R-Y CH PRD. C.B.A. TP2656 (CH SEL) TP2653 (GND) TP2651 (FL TEST) TP2653 (GND)	
ADJ.	VR2651 (AMB R-Y) VR2653 (AMB B-B)	
SPEC.	Set bright dot to position as shown in Fig. II-58.	

* Full auto white balance adjustment 2

MODE	FAMB B-Y CH PRO. C.B.A. TP2656 (CH SEL) TP2652 (+5V) TP2651 (FL TEST) TP2653 (GND)	
ADJ.	VR2652 (AWB B-Y)	
SPEC.	Set bright dot to position as shown in the Fig. II-58.	

* Note: Turn VR gradually.

Procedures:

- (1) Shoot white chart with halogen lamp lighted.
- (2) Set each bright dots as in Fig. II-58, respectively.

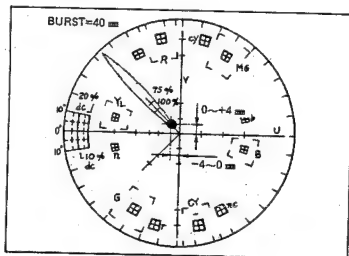


Fig. II-58

5-12 Full auto white balance adjustment 3

CHART	White chart	
M. EQ.	Vectorscope	
TOOL	Halogen lamp	
MODE	FAMB R+B	
	PRO. C.B.A.	
	TP2656 (CH SEL)	TP2653 (GND)
ADJ.	TP2651 (FL TEST)	Open
	VR2654 (AWB R+B)	

* Note: Do not turn VR excessively.

Procedures:

- (1) Shoot white chart with halogen lamp lighted.
- (2) Shift bright dot in direction of B-Y+ . (VR2654)
- (3) Turn VR2654 reversely to above direction until bright dot comes to the position in Fig. II-59.

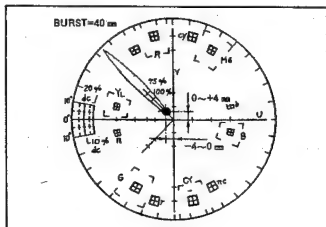


Fig. II-59

5-13 Blooming adjustment

CHART	U-pattern chart (with white paper)	
MODE	Iris opened	
	TP2201 (IRIS O/C)	TP2652 (S V)
M. EQ.	Oscilloscope	
TOOL	ND-2.0 filter (DY9-2044-000)	
	Halogen lamp, White paper (thin one), Fixture (supplement for AIE,F's Service Manual)	
TP/TRIG.	PRO. C.B.A. TP2202 (S/H OUT)	TP2204 (FH/2)
ADJ.	SENS. C.B.A. VR2101 (V SUB)	
SPEC.	TYPE I Suppress blooming	
	TYPE II 1000 mVp-p	

* Note: Perform this adjustment only when the CCD is replaced.
Before the SENSOR C.B.A. is replaced, measure the voltage at pin 14 of CCD (V SUB) in advance.
After mounting the new C.B.A., adjust the VR2101 to make the pin voltage same as that measured in advance.

Procedures:

- (1) Open the iris. (TP2201 → TP2652)
- (2) Attach the ND-2.0 filter on the front face of lens with the fixture. (supplement for AIE,F's Service Manual)
- (3) Prepare a U-pattern chart with a white paper attached on its rear side.
- (4) Make setting as shown in the Fig. II-60.
- (5) Shoot the U-pattern chart with up side down. (Standard angle of view)
- (6) Locate the halogen lamp so that the signal level at TP2202 becomes 300 mVp-p ("A" in the figure).
Also, adjust the angle of halogen light so that the waveform in the Fig. II-61 is obtained.
- (7) Remove the ND-2.0 filter and observe the monitor TV. (Fig. II-62)
- (8) Adjust VR2101 to check if the blooming is appeared.

Adjust the signal level at TP2202 to 1100 mVp-p ("a" in the figure) by VR2101.

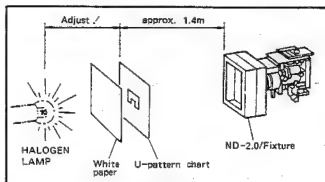


Fig. II-60

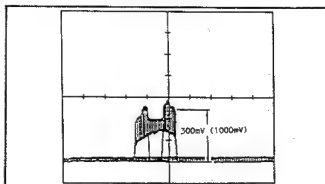
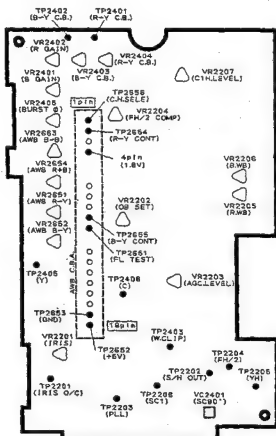


Fig. II-61

10 mV/10 μs

Locations of TP/VR/VC

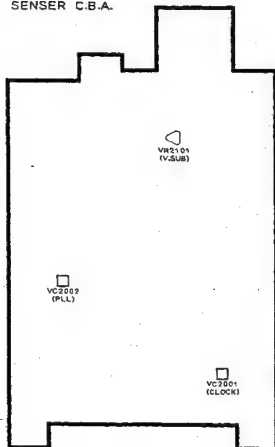
PROCESS C.B.A.



TP	2201	IRIS O/S	VR	2201	IRIS
	2202	S/H OUT		2202	OB SET
	2203	PLL		2203	AGC. LEVEL
	2204	FH/2		2204	FH/2 COMP
	2205	YH		2205	R.WB
	2206	SC1		2206	B.WB
	2401	R-Y C.B.		2207	C1H LEVEL
	2402	B-Y C.B.		2401	B GAIN
	2403	W.CLIP		2402	R GAIN
	2405	Y		2403	B-Y C.B.
	2406	C		2404	R-Y C.B.
	2651	FL TEST		2405	BURST Ø
	2652	+5V		2651	AMB R-Y
	2653	GND		2652	AMB B-Y
	2654	R-Y CONT		2653	AMB B-B
	2655	B-Y CONT		2654	AMB R+B
	2656	C.H. SELE	VC	2401	SC90°

AMB C.B.A. 4 pin 1.8V

SENSOR C.B.A.



VR	2101	V.SUB
VC	2001	CLOCK
	2002	PLL

6. Electrical Adjustments (Recorder Section)

* Notes: 1. Before the following adjustments perform the input adjustment.

Procedures:

- (1) Connect an input connector to make the recorder section adjustment setting. (Refer to the Fig. II-39.)
- (2) Set the pattern generator at white 100% state.
- (3) Adjust the output level of pattern generator to 0.49 Vp-p (TP109, R.MAIN C.B.A.)

* Notes: 2. REC or EE: CAMERA MODE
PB : RECORDER MODE

6-1 SS5V adjustment

MODE	EE
M. EQ.	Digital voltmeter
TP/TRIG.	R.MAIN C.B.A. TP601 (SS 5V)
ADJ.	R.MAIN C.B.A. VR603 (SS 5V)
SPEC.	5.1 ± 0.05 V

6-2 Undercut adjustment

MODE	REC
M. EQ.	Digital voltmeter, Monitor TV.
ADJ.	GRIP C.B.A. VR2961 (BATT)
SPEC.	$BATT = 80 \pm 0.1H/5.65 \pm 0.1 - 0.05$ V

Procedures:

- (1) Set a power source voltage at 5.65 V.
- (2) Set the SERVICE MODE [S-1] with a wireless remote controller.
- (3) Turn VR until the spec. obtained.

6-3 ATF bias adjustment

SIGNAL	Color bar signal
MODE	REC PAUSE
M. EQ.	Monitor TV
ADJ.	R.MAIN C.B.A. VR401 (ATF)
SPEC.	$ATF = 80 \pm 0.3$ H

Procedures:

- (1) Short-circuit TP402 (16K) and TP403 (47K) of SS C.B.A. by using a capacitor. (Use a capacitor approx. $10 \mu F/10$ V.)
- (2) Set the SERVICE MODE [S-1] with a wireless remote controller.
- (3) To set the REC PAUSE MODE, change the RECORDER mode to the CAMERA mode.
- (4) Turn VR until the spec. obtained.

6-4 Switching point adjustment

SIGNAL	Monoscope master (DY9-1062-000)
MODE	PB
M. EQ.	Oscilloscope
TP/TRIG.	R.MAIN C.B.A. CN110-13PIN (HSW), VIDEO OUT
ADJ.	R.MAIN C.B.A. VR602 (PG)
SPEC.	7 ± 1 H

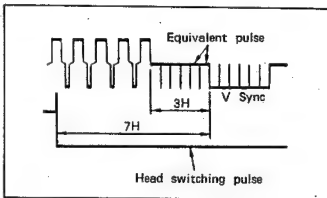


Fig. II-62

6-5 AV5V adjustment

MODE	EE
M. EQ.	Digital voltmeter
TP/TRIG.	R.MAIN C.B.A. TP102 (AV5V)
ADJ.	R.MAIN C.B.A. VR101 (AV5V)
SPEC.	5.1 ± 0.05 V

6-6 VIDEO LEVEL adjustment

SIGNAL	100% white video signal
MODE	EE
M. EQ.	Oscilloscope
TP/TRIG.	R.MAIN C.B.A. TP110 (Y)
ADJ.	R.MAIN C.B.A. VR112 (Y LEVEL)
SPEC.	0.5 ± 0.05 Vp-p

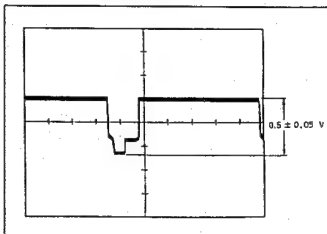


Fig. II-63

20 mV/10 μ s

6-7 YC separation adjustment

SIGNAL	Color bar signal
MODE	EE
M. EQ.	Oscilloscope
TP/TRIG.	R.MAIN C.B.A. TP107 (EMPHASIS)
ADJ.	R.MAIN C.B.A. VR107 (Y/C SEP)
SPEC.	Minimize chrominance component as possible.

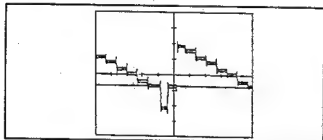


Fig. II-64 20 mV/10 μ s

6-8 Y FM carrier adjustment

SIGNAL	Black (Cut R.G. and B with raster.)
MODE	REC (SP)
M. EQ.	Oscilloscope
TP/TRIG.	TP106 (Y FM)
ADJ.	VR109 (Y CAR.)
SPEC.	0.24 μ sec./1 cycle (4.2 MHz approx.)



Fig. II-65 10 mV/50 ns

* Note: Use the signal waveform having longer cycle.

6-9 Y FM deviation adjustment

* Note: Use the signal waveform having the shortest cycle.

SIGNAL	100% white video signal
MODE	EE
M. EQ.	Oscilloscope
TP/TRIG.	R.MAIN C.B.A. TP106 (Y FM)
ADJ.	R.MAIN C.B.A. VR108 (Y DEV)
SPEC.	0.37 μ sec./2 cycle (5.4 MHz approx.)

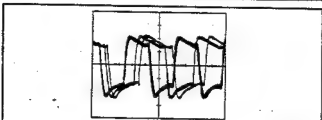


Fig. II-66 10 mV/50 ns

6-10 FM audio carrier adjustment

SIGNAL	No signal (Terminal-opened)
MODE	EE
M. EQ.	Oscilloscope, Frequency counter
TP/TRIG.	R.MAIN C.B.A. TP103 (A FM)
ADJ.	R.MAIN C.B.A. VR104 (A CAR)
SPEC.	1.5 \pm 0.02 MHz

6-11 FM audio deviation adjustment

SIGNAL	D.O. Adj. Master (DY9-1064-000)
MODE	PB
M. EQ.	Oscilloscope
TP/TRIG.	R.MAIN C.B.A. PIN JACK (AUDIO OUT)
ADJ.	R.MAIN C.B.A. VR103 (A DEV)
SPEC.	890 \pm 50 mVp-p

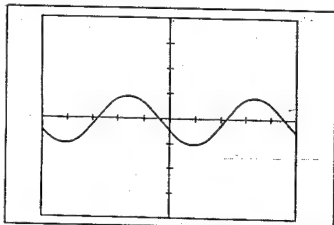


Fig. II-67 50 mV/0.5 ms

6-12 Recording current adjustment

(1) Luminance signal

SIGNAL	No signal (terminal-opened)
MODE	REC
M. EQ.	Oscilloscope
TP/TRIG.	HA C.B.A. TP220 (REC CURR)
ADJ.	R.MAIN C.B.A. VR106 (REC Y)
SPEC.	300 \pm 10 mVp-p

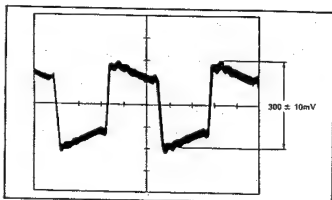


Fig. II-68 10 mV/50 ns

(2) Chrominance/Audio/ATF signals

* Note: To connect TP220 with a recording current checker, use a probe (1:1).

MODE	REC
M. EQ.	Oscilloscope
TP/TRIG.	HA C.B.A. TP220 (REC CURR)
TOOL	Recording current checker (DY9-1056-000)

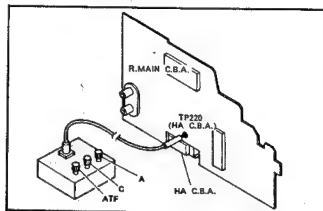


Fig. II-69

Chrominance

SIGNAL	RED raster signal
ADJ.	R.MAIN C.B.A. VR102 (REC C)
SPEC.	2.3 ± 0.1 Vp-p

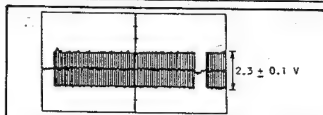


Fig. II-70

50 mV/2 ms

Audio

SIGNAL	Red raster signal
ADJ.	R.MAIN C.B.A. VR105 (REC AFM)
SPEC.	$1.5 \text{ V} \pm 0.1 \text{ Vp-p}$

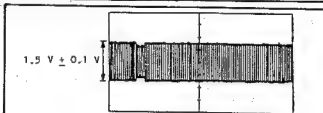


Fig. II-71

50 mV/2 ms

ATF

SIGNAL	Red raster signal
ADJ.	R.MAIN C.B.A. VR111 (REC 4f)
SPEC.	DC 0.7 ± 0.1 V

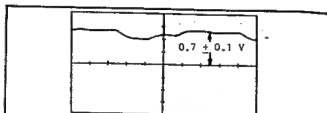


Fig. II-72

5 mV/10 μs

6-13 Playback Y level adjustment

SIGNAL	100% white video signal
MODE	PB
M. EQ.	Oscilloscope
TP/TRIG.	R.MAIN C.B.A. TP108 (PB VIDEO)
ADJ.	R.MAIN C.B.A. VR110 (PB Y)
SPEC.	0.46 ± 0.02 V



Fig. II-73

10 mV/10 μs

6-14 Character position of character generator adjustment

* Note: Make characters display with a wireless remote controller.

SIGNAL	Color bar
MODE	EE
M. EQ.	Monitor TV
TP/TRIG.	GRIP C.B.A. VC2941 (CG SIZE)
SPEC.	Lowermost digit of counter located in the middle of blue and black color bars

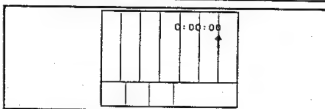


Fig. II-74

6-15 JOG chrominance phase adjustment

SIGNAL	Red signal (pattern generator)
MODE	Search
M. EQ	Monitor
ADJ.	VR113 (JOG BURST)
SPEC.	Eliminate the block stripes

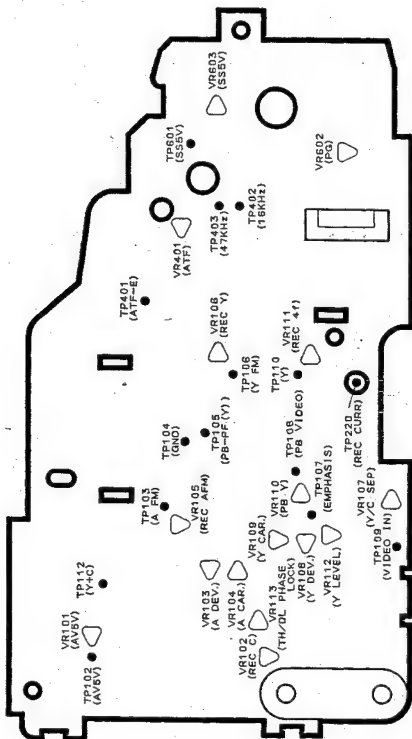
Procedures:

- 1) Record red signal in LP mode.
- 2) Playback and search the recorded part.
- 3) Eliminate the block stripes on the screen.

Locations of TP/VR/VC

RECORDER-MAIN C.B.A.

R.MAIN C.B.A.



TP	102	AV5V
	103	A FM
	104	GND
	105	PB-RF (Y)
	106	Y FM
	107	EMPHASIS
	108	PB VIDEO
	109	VIDEO IN
	110	Y
	112	Y+C
	220	REC CURR
	401	ATF-E
	402	16KHz
	403	47KHz
	601	SS5V
VR	101	AV5V
	102	REC C
	103	A DEV.
	104	A CAR.
	105	REC AFM
	106	REC Y
	107	Y/C SEP
	108	Y DEV.
	109	Y CAR.
	110	PB Y
	111	REC 4f.
	112	Y LEVEL
	113	TH/DL PHASE LOCK
	401	ATF
	602	PG
	603	SS5V

7. EVF Adjustments

7-1 Free-run frequency adjustment

SIGNAL	No signal (Terminal-opened)
MODE	EE
M. EQ.	Oscilloscope, frequency counter
TP/TRIG.	GRIP C.B.A. TP2901 (HD)
ADJ.	GRIP C.B.A. VR2902 (H. PHASE)
SPEC.	15.90 ± 0.05 KHz

7-2 Vertical amplitude adjustment

SIGNAL	Monoscope master (DY9-1062-000)
MODE	PLAY
M. EQ.	EVF, Monitor TV
ADJ.	GRIP C.B.A. VR2901 (V-SIZE)
SPEC.	Circle on monoscope master free from distortion. Absence of incongruity in comparison with monitor TV screen

7-3 Rotation and centering adjustment

SIGNAL	Monoscope master (DY9-1062-000)
MODE	PLAY
M. EQ.	EVF
ADJ.	Deflection yoke, centering magnet
SPEC.	Screen is not tilted and is located right at the center.

Procedures:

- (1) Loosen the fastening ring to enable the deflection yoke to be moved.
 - (2) Turn the deflection yoke to correct screen tilt.
- * Note: Move the deflection yoke completely toward the CRT screen.
- (3) Tighten the fastening ring.
- * Note: The fastening ring must be tightened so that the centering magnet can still be moved.
- (4) Adjust the centering magnet so as to locate the picture at the center.
 - (5) Tighten the fastening ring completely.
- * Note: Pay attention not to overtighten the ring.
- (6) Fix the centering magnet by applying paint or the like (in 180° direction, at 2 points.).

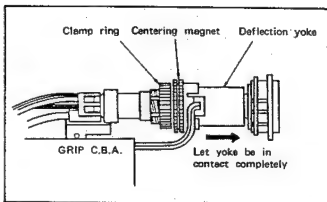


Fig. II-75

7-4 Brightness adjustment

SIGNAL	Self-record/playback tape (grayscale)
MODE	PLAY
M. EQ.	EVF
ADJ.	GRIP C.B.A. VR2904 (BRIGHT)
SPEC.	Distinguishable down to 11th step grayscale

7-5 Focus adjustment

MODE	Lens-capped (character display)
M. EQ.	EVF
ADJ.	GRIP C.B.A. VR2903 (FOCUS)
SPEC.	EVF character under optimum focus

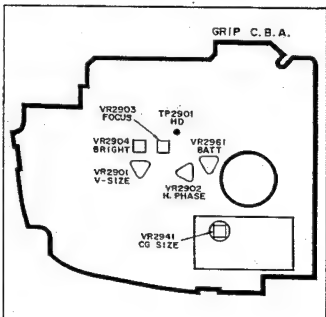


Fig. II-76

8. Mechanical Adjustment of Recorder Section

For mechanical adjustment of the recorder section, refer to the MC-4B service manual. The additional mechanical adjustment items only applied for E30A are explained here.

① Service mode (220° 70%)

Service mode (220° 70%) is set for tracking fine adjustment (3-2-3). However, sometimes the waveform does not match 70% RF envelope output. In such cases, turn the VR401 (on R.MAIN C.B.A.) until the waveform is adjusted to 70%.

* Note: After tracking fine adjustment, readjust the ATF bias (6-3) and return the VR401 to the original position.

② Tape transport adjustment

Perform the tape transport adjustment referring to the setting 3-2-1 (3) on page II-16.

CONTENTS

CHAPTER IV. DIAGRAMS

1. Interconnection Diagram	N-1
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Guide to diagrams

1. Color coding

(1) Signal lines in block diagrams

Camera section

Red (——) : Y
(----) : C

Video section

Red (——) : Recording
(----) : Playback

Syscon-servo section

Red (——) : Drum servo signal
(----) : Capstan servo signal

(2) Voltage on circuit diagram

Red : Recording
Black : Playback

(3) Signal lines on circuit diagrams

Camera section

Red : Power supply line
Blue : Luminance signal
Orange : Chrominance signal
Gray (————) : Luminance + Chrominance signals

Recorder section

Blue (——) : Capstan PWM signal
(----) : Capstan ATF signal
(——) : Capstan FG signal
Orange (——) : Drum PWM signal
(----) : Drum FG signal
(——) : Drum PG signal

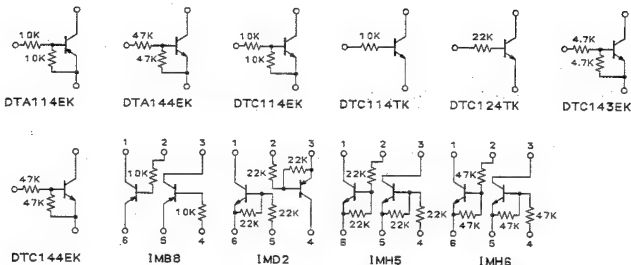
Recorder section

Gray (————) : Recording luminance + Chrominance signals
(——) : Playback luminance + Chrominance signals
Blue (——) : Recording luminance signal
(----) : Playback luminance signal
Orange (——) : Recording chrominance signal
(——) : Playback chrominance signal
Red (——) : Recording audio signal
(----) : Playback audio signal

(4) PC board layout

Orange : Component side
Netted black (————) : Soldering side
Black : Parts on component side
Blue : Parts on soldering side

2. Equivalent circuits of digital transistor



3. Indications on circuit diagram

- Resistance is represented in ohms (Ω).
- Capacitance is represented in farads (F).
- Voltages of capacitor are 25 V unless otherwise specified.
- Wattage of resistor is 1/16 W unless otherwise specified.
- Voltages are measured with a digital voltmeter.
- Waveform photographs are taken by using a 10:1 probe.
- IC No. in each C.B.A.s are listed on the bottom of diagrams.
- No. colored in blue are corresponded to the No. of waveform photographs.
- Voltage values indicated in circuit diagram are based on the following condition.

Camera section

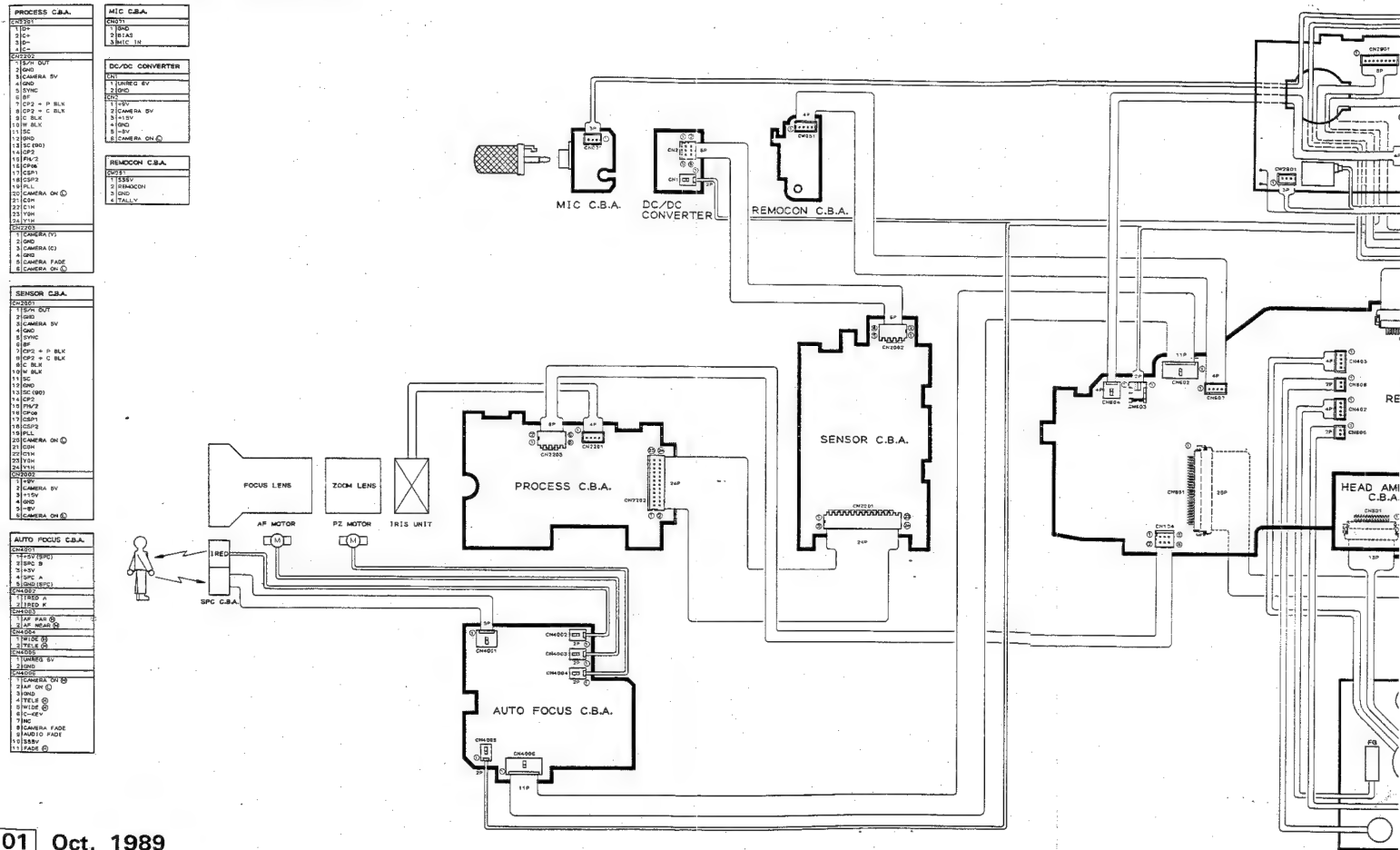
Color bar, standard angle of view, AWB-preset

Recorder section

Recording : Color bar (pattern generator)

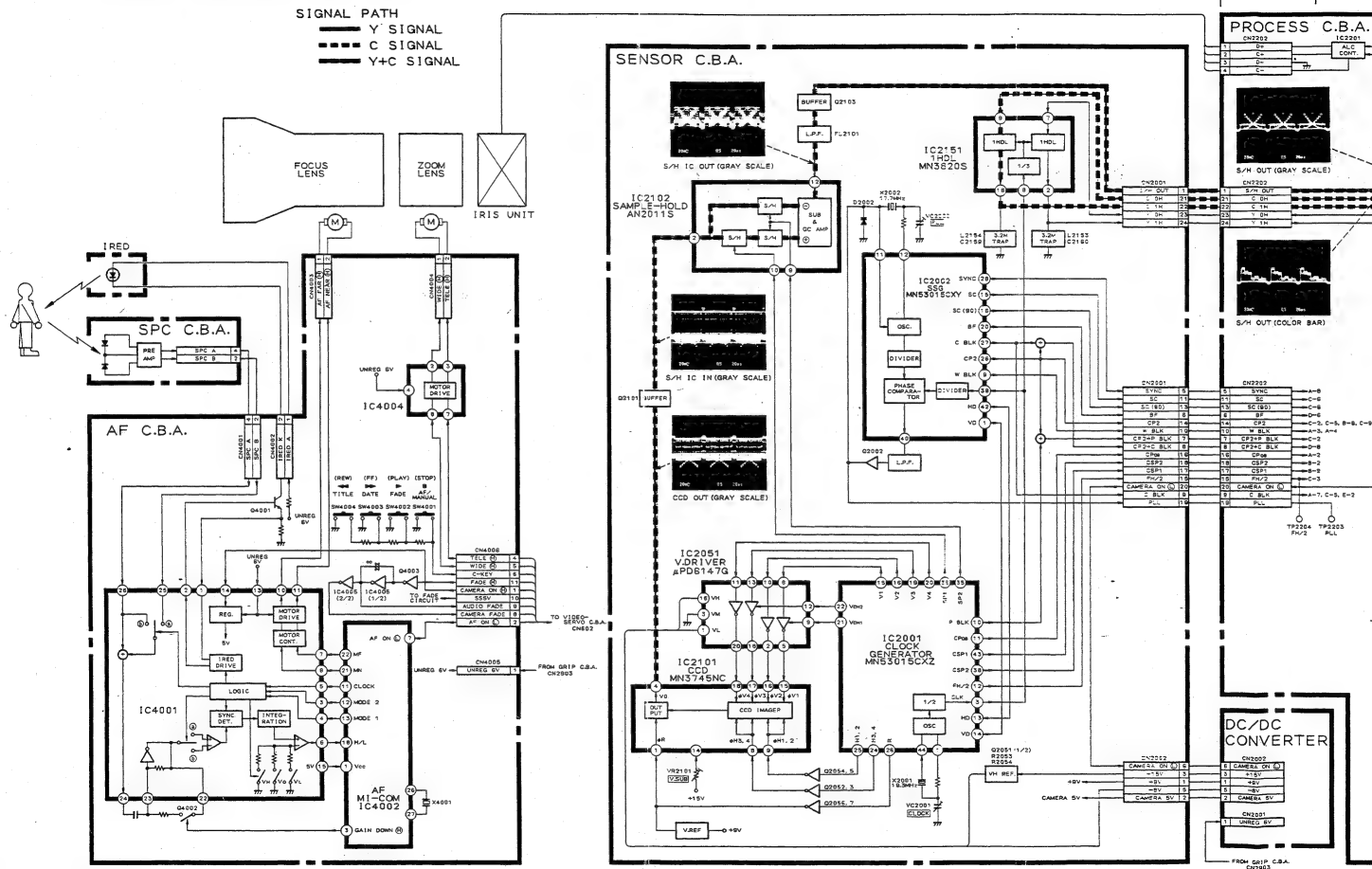
Playback : Self-recording Playback (Color bar)

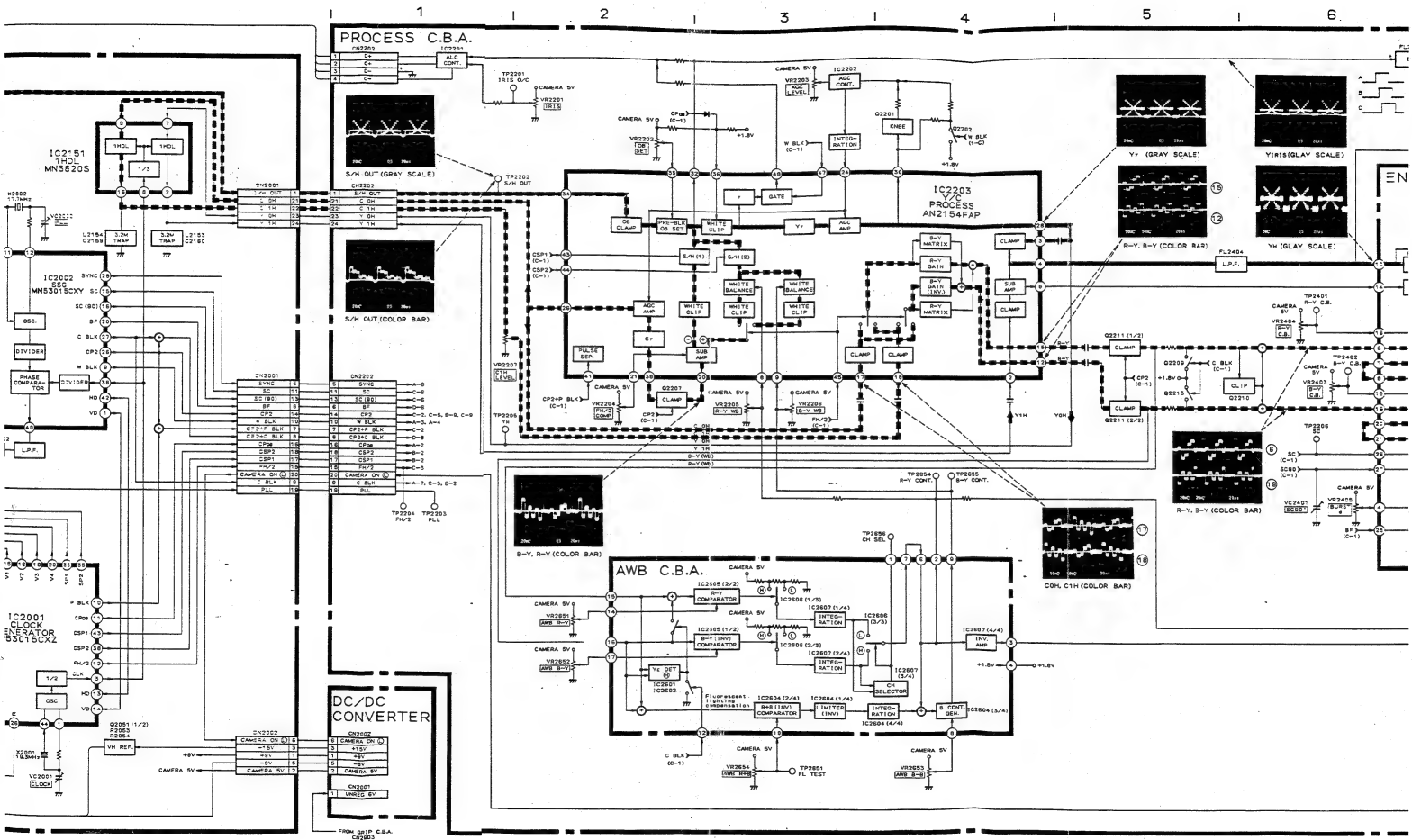
01 Oct. 1989



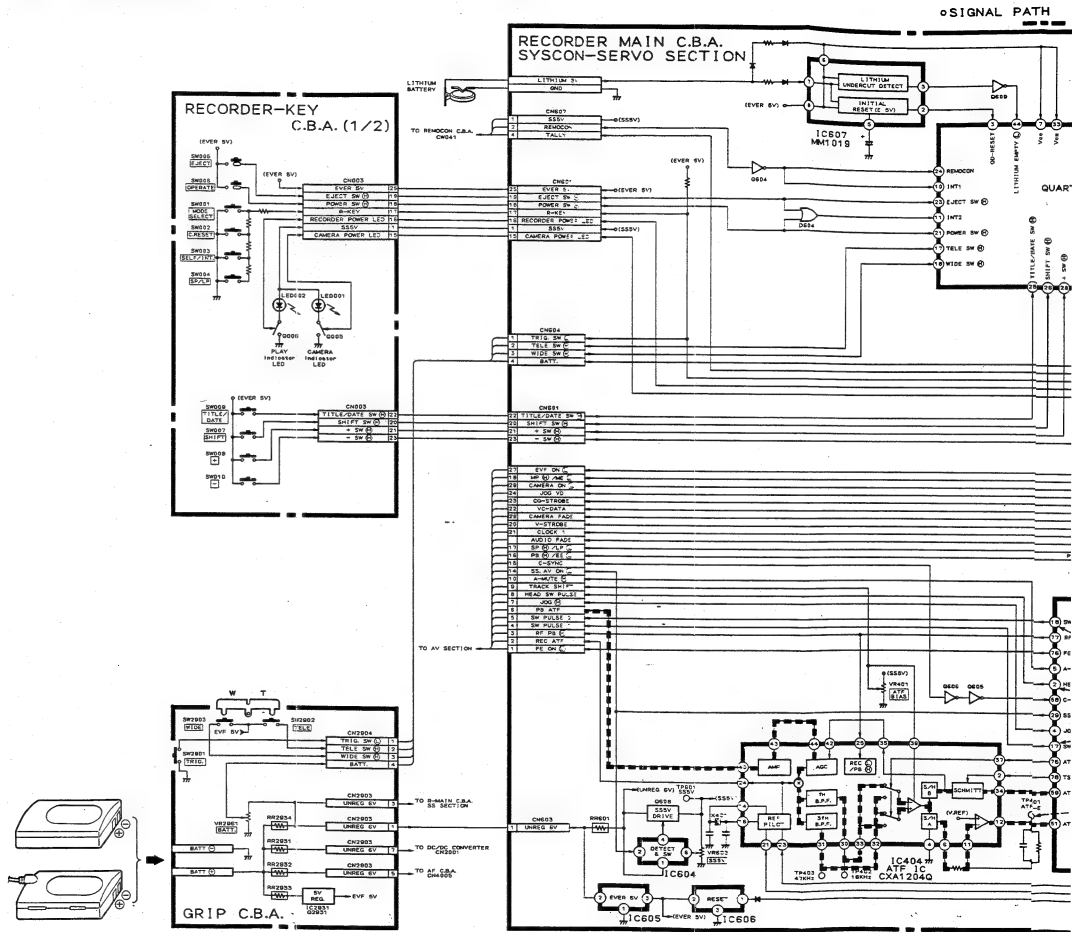
BLOCK DIAGRAM CAMERA SECTION

SIGNAL PATH
 — Y SIGNAL
 - - - C SIGNAL
 — Y+C SIGNAL



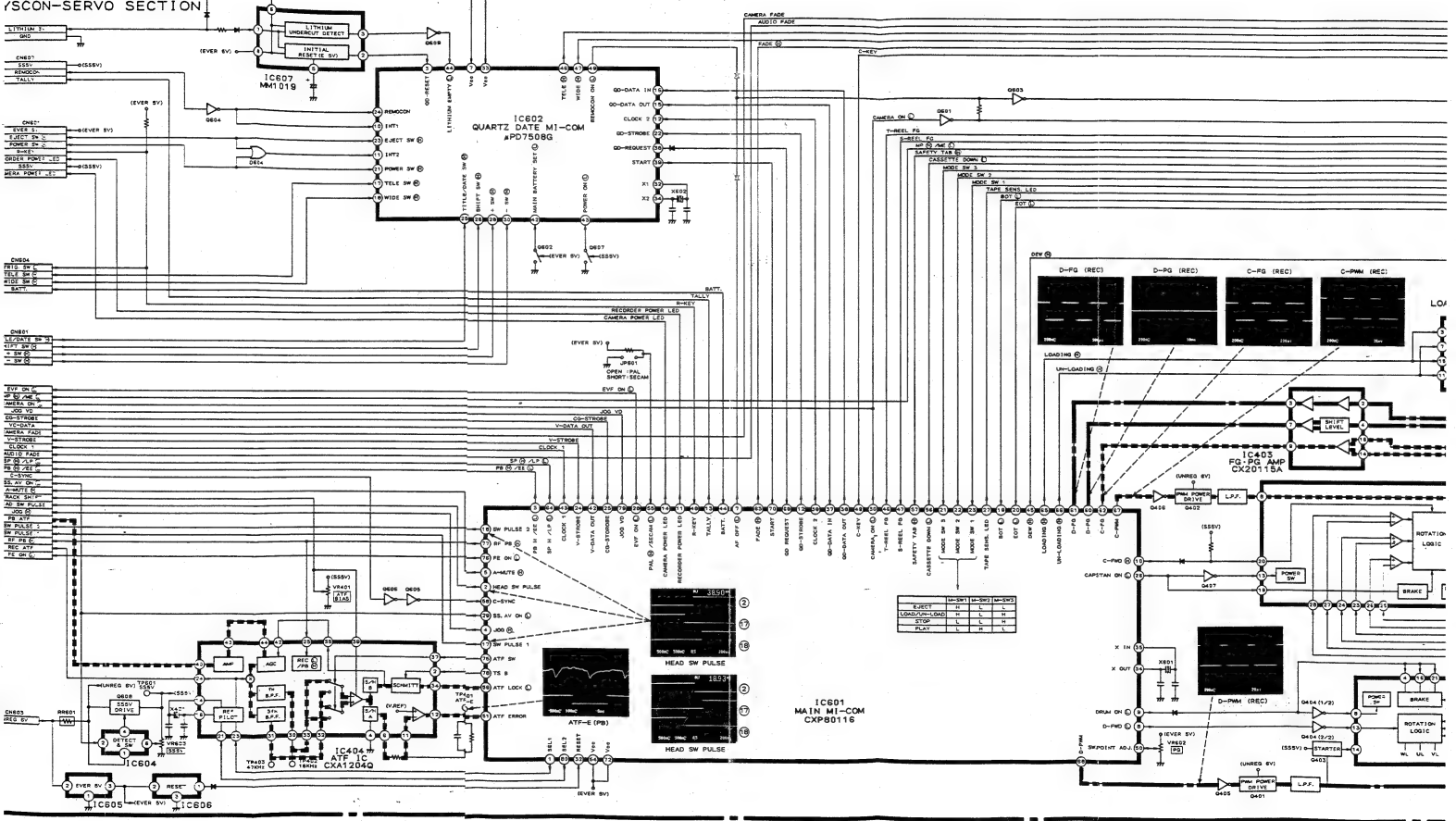


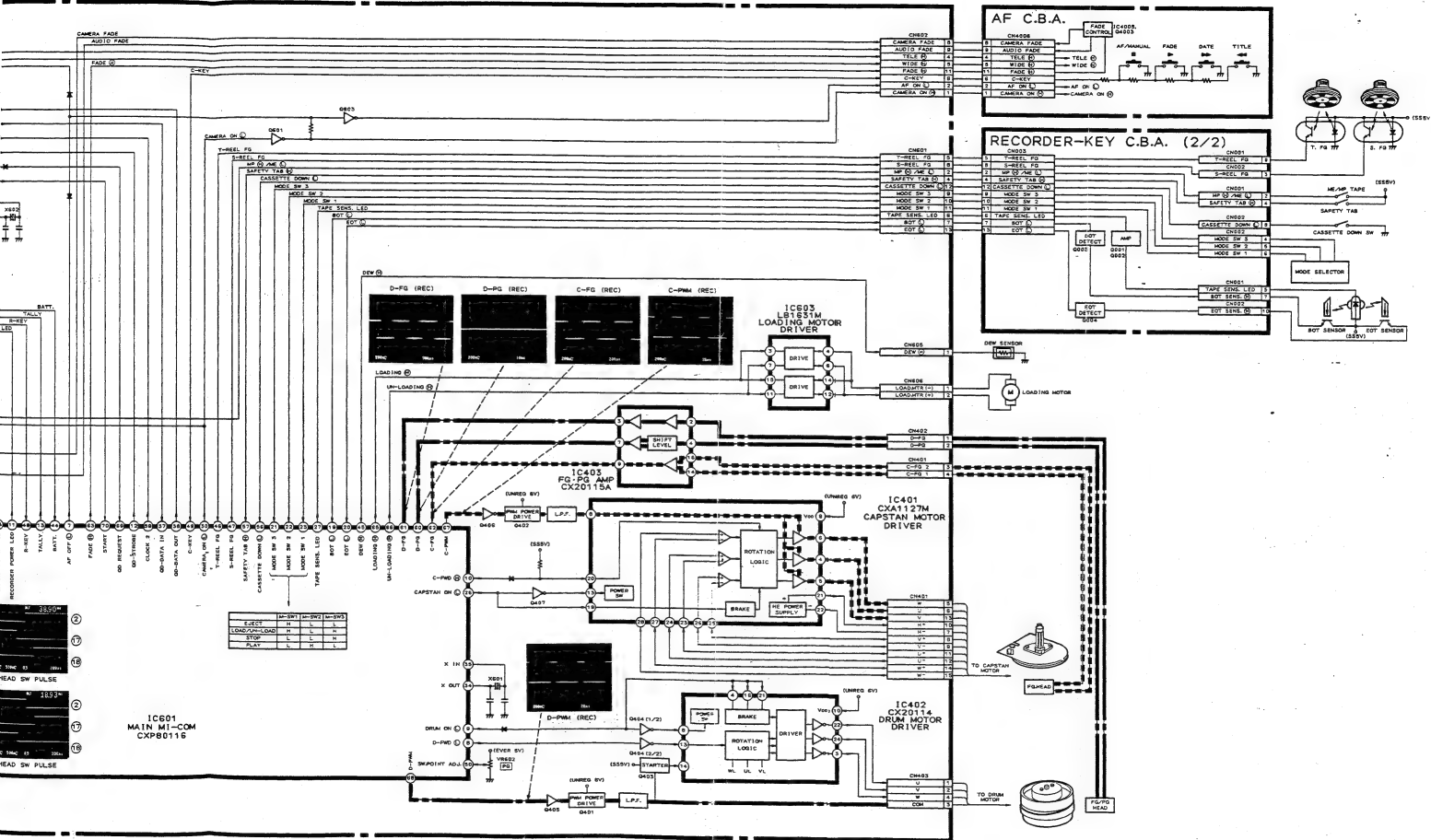
BLOCK DIAGRAM SYSCON-SERVO SECTION



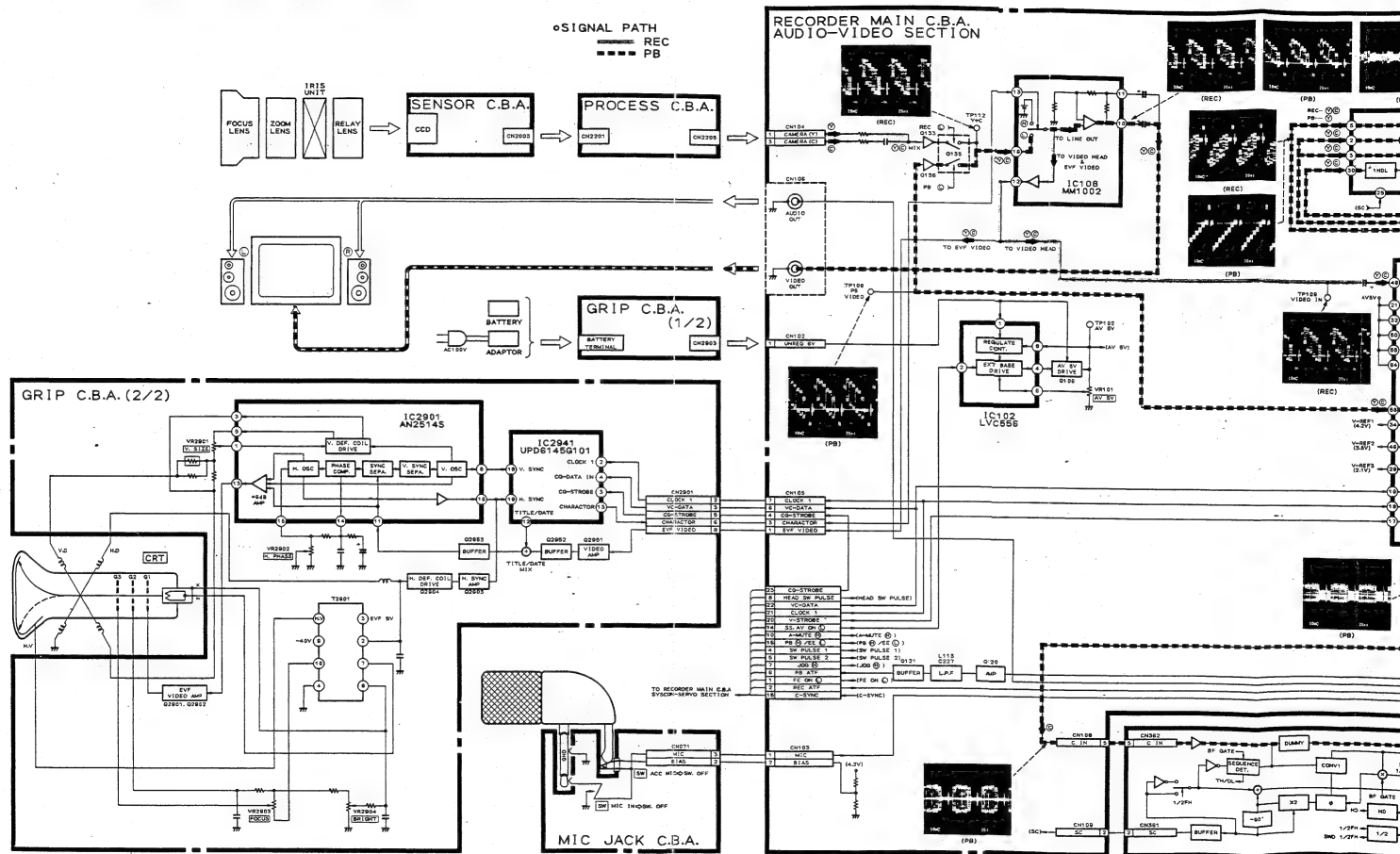
REORDER MAIN C.B.A. /SCON-SERVO SECTION

• SIGNAL PATH --- DRUM SERVO ---- CAPSTAN SERVO





01 Oct. 1989



RECORDER MAIN C.B.A. AUDIO-VIDEO SECTION

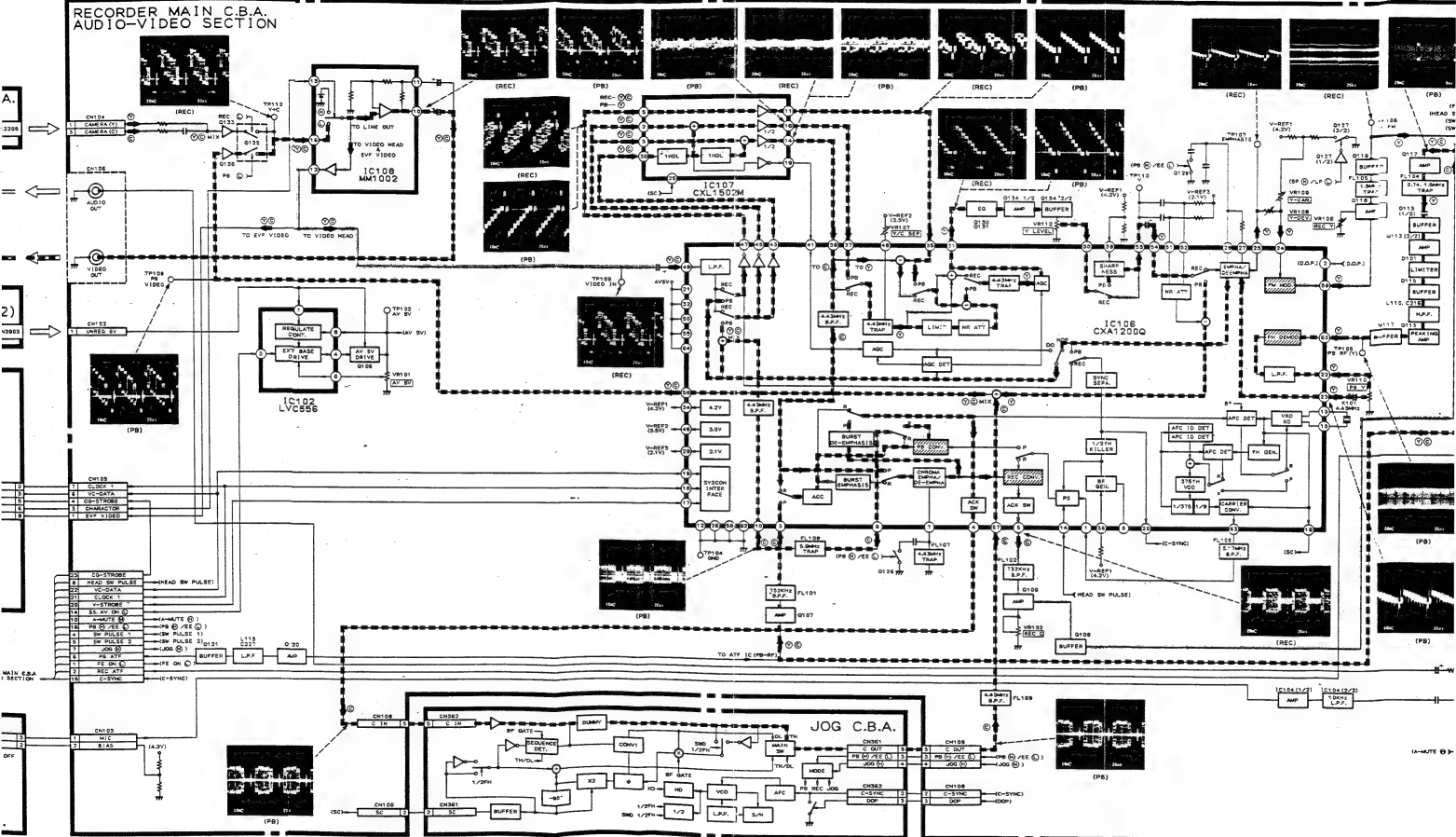
A.

2)

MAIN C.B.A.
SECTION

OFF

0



CIRCUIT BOARD DIAGRAM SENSOR • GRIP C.B.A.

< NOTICE >

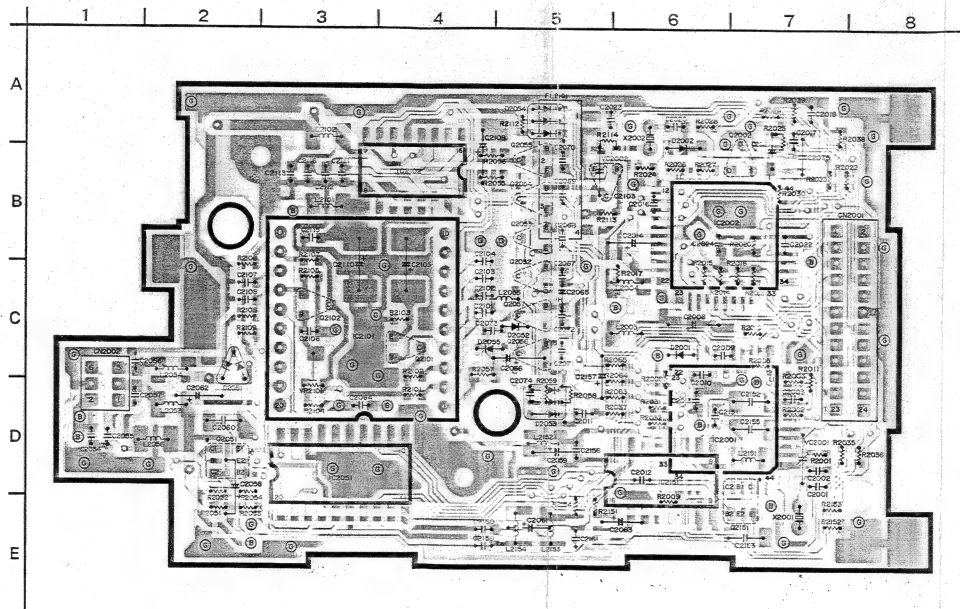
Sensor C.B.A. consists of four layers.
(Soldering, Component, Ground and Camera 5V patterns.)

※ Through-hole marks on each C.B.A. denote:

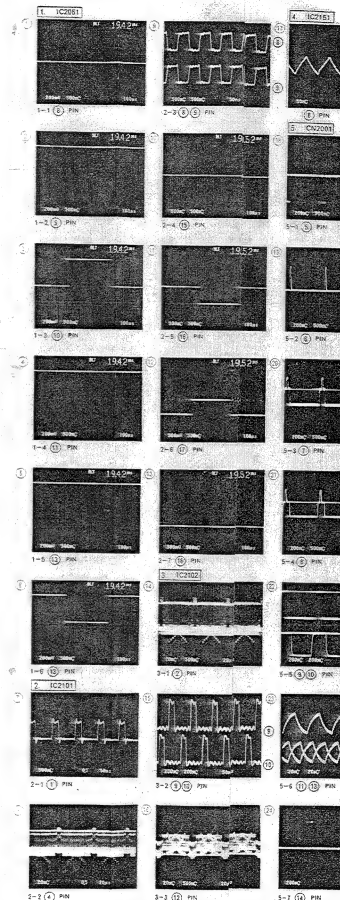
- : Soldering side ↔ Component side
- ⑥ : Soldering side (Component side) ↔ Ground
- ⑤ : Soldering side (Component side) ↔ Camera 5V

SENSOR C.B.A.

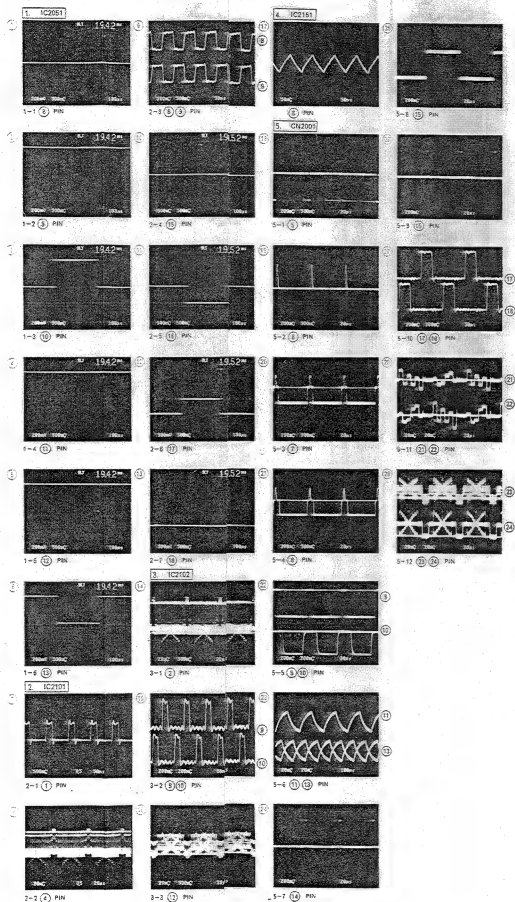
D2001	C-6
D2002	B-6
D2051	C-2
D2052	C-5
D2053	D-5
D2054	A-5
D2055	C-4
IC2001	D-6
IC2002	B-6
IC2051	D-3
IC2101	C-3
IC2102	B-4
IC2151	D-6
Q2002	B-7
Q2051	D-2
Q2052	C-5
Q2053	B-5
Q2054	B-5
Q2055	B-5
Q2056	C-5
Q2057	C-5
Q2101	C-4
Q2102	C-3
Q2103	B-5
Q2151	E-7



SIGNAL WAVEFORMS

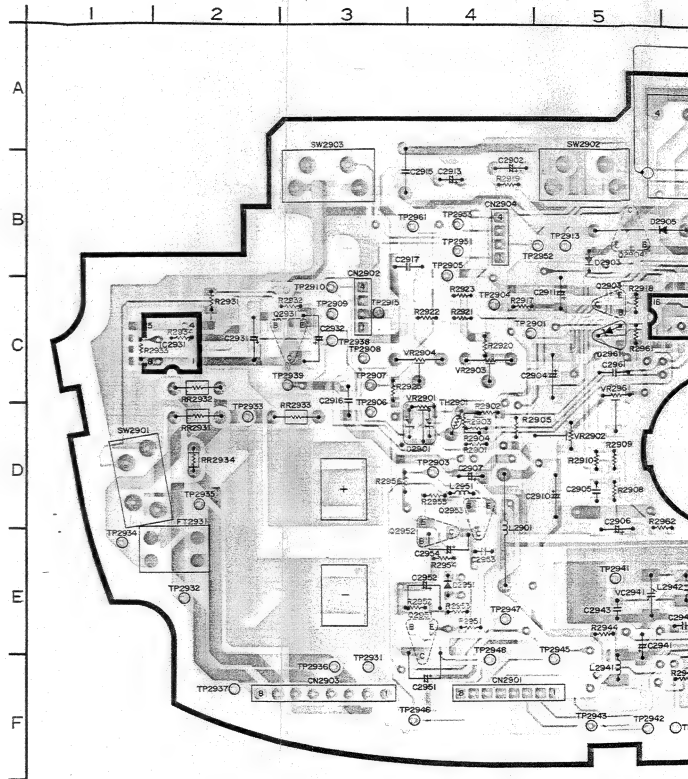


SIGNAL WAVEFORMS



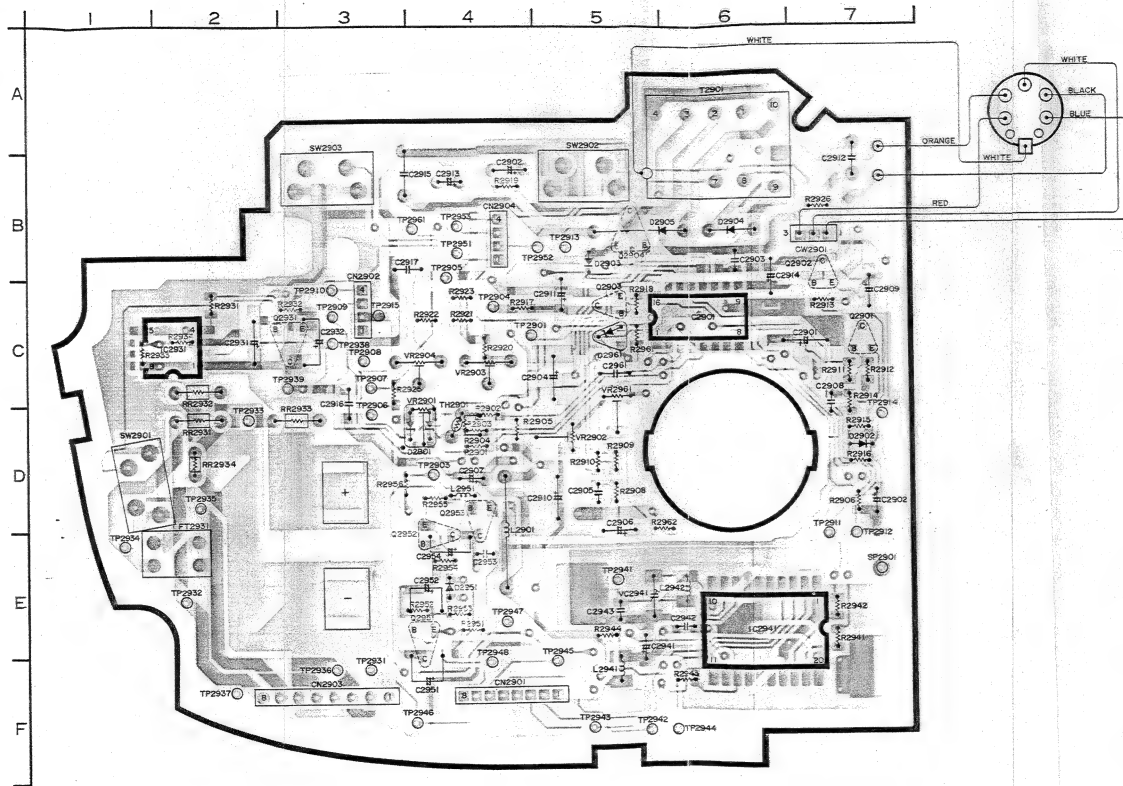
GRIP C.B.A.

D2901	D-4
D2902	D-7
D2903	B-5
D2904	B-6
D2905	B-5
D2951	E-4
D2961	C-5
IC2901	C-6
IC2931	C-2
IC2941	E-6
Q2901	C-7
Q2902	B-7
Q2903	C-5
Q2904	B-5
Q2931	C-3
Q2951	E-4
Q2952	D-4
Q2953	D-4

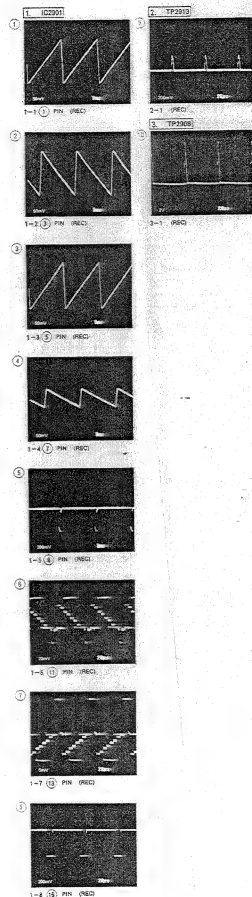


P C.B.A.

0.1	D-4
0.2	D-7
0.3	B-5
0.4	B-8
0.5	B-5
5.1	E-4
6.1	C-5
0.1	C-6
3.1	C-2
4.1	E-6
0.1	C-7
0.2	B-7
0.3	C-5
0.4	B-5
3.1	C-3
5.2	D-4
5.3	D-4



SIGNAL WAVEFORMS



01 Oct. 1989

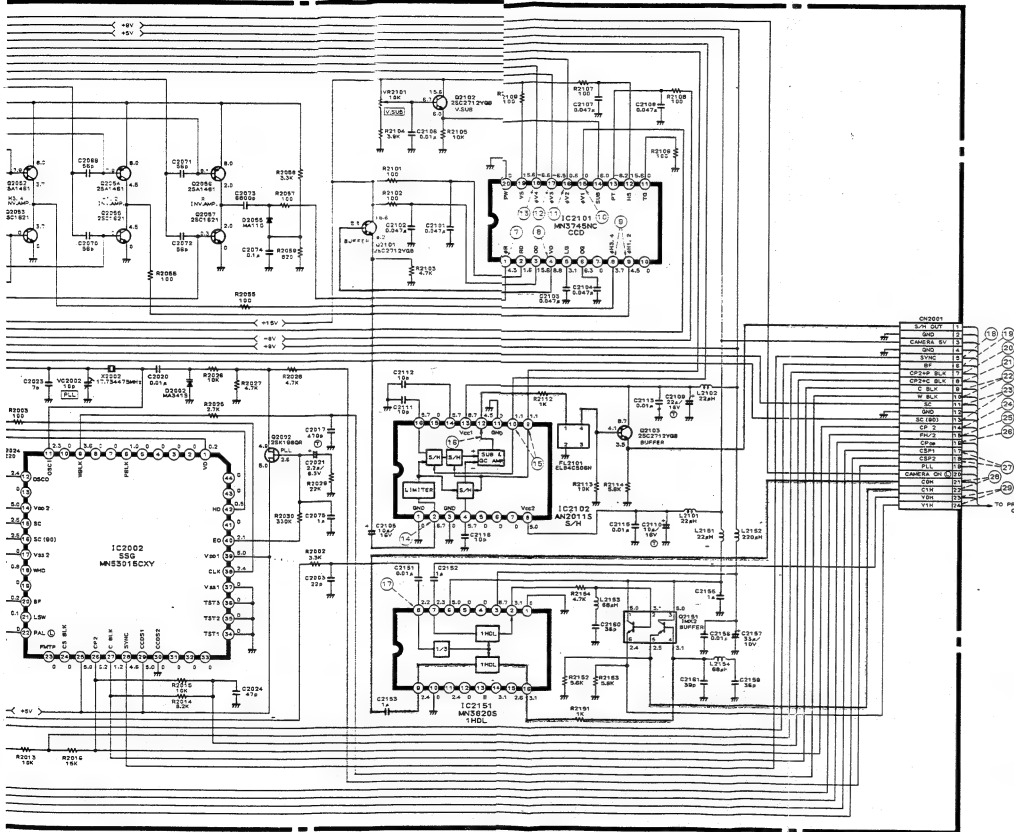


IC2001

IC2002

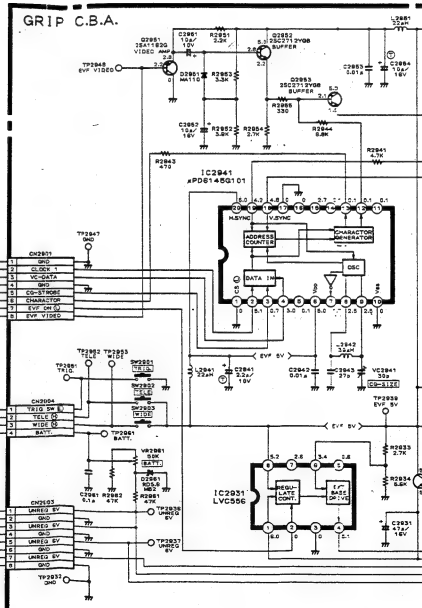
IC2102 IC2151 IC2101

C SIGNAL (ORANGE)



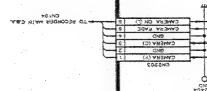
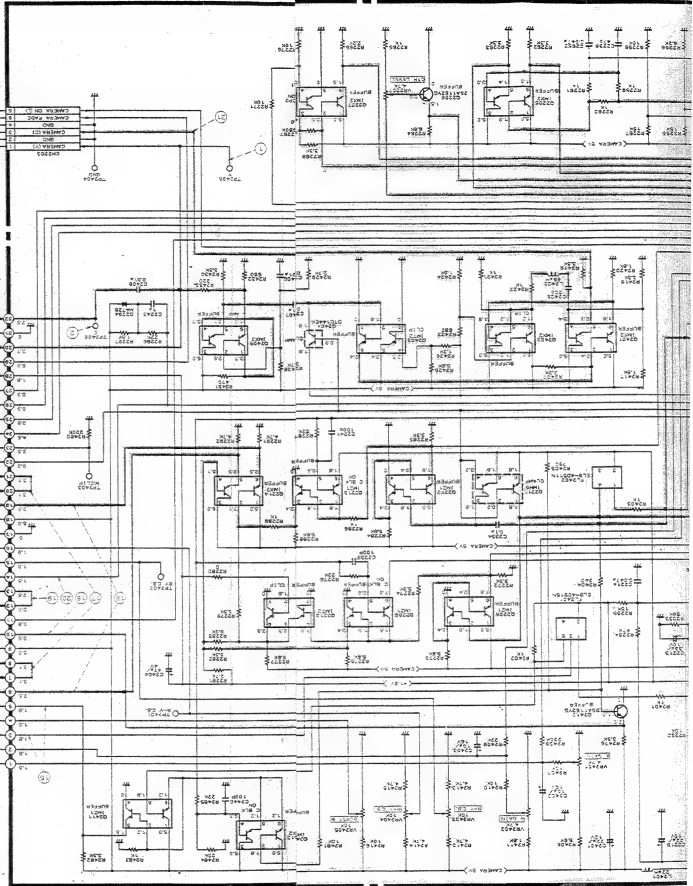
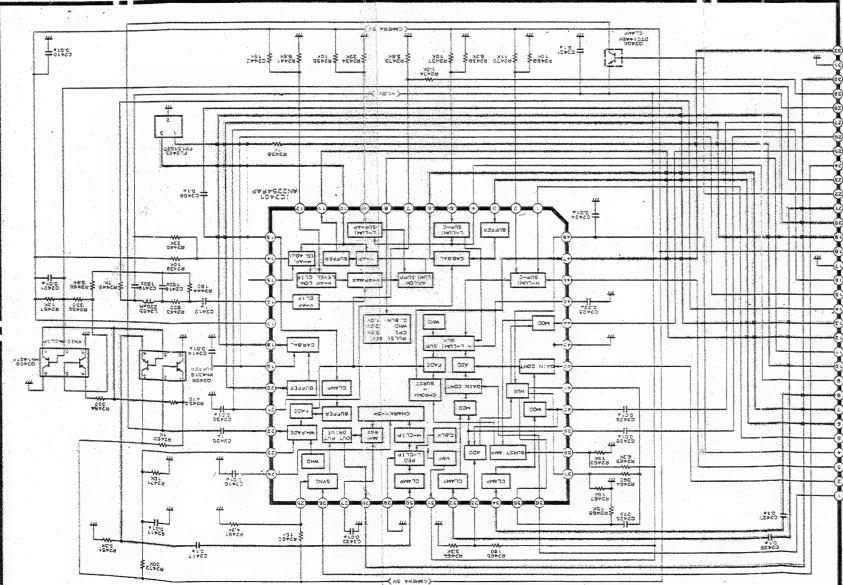
IC2002

IC2102 IC2151 IC2101



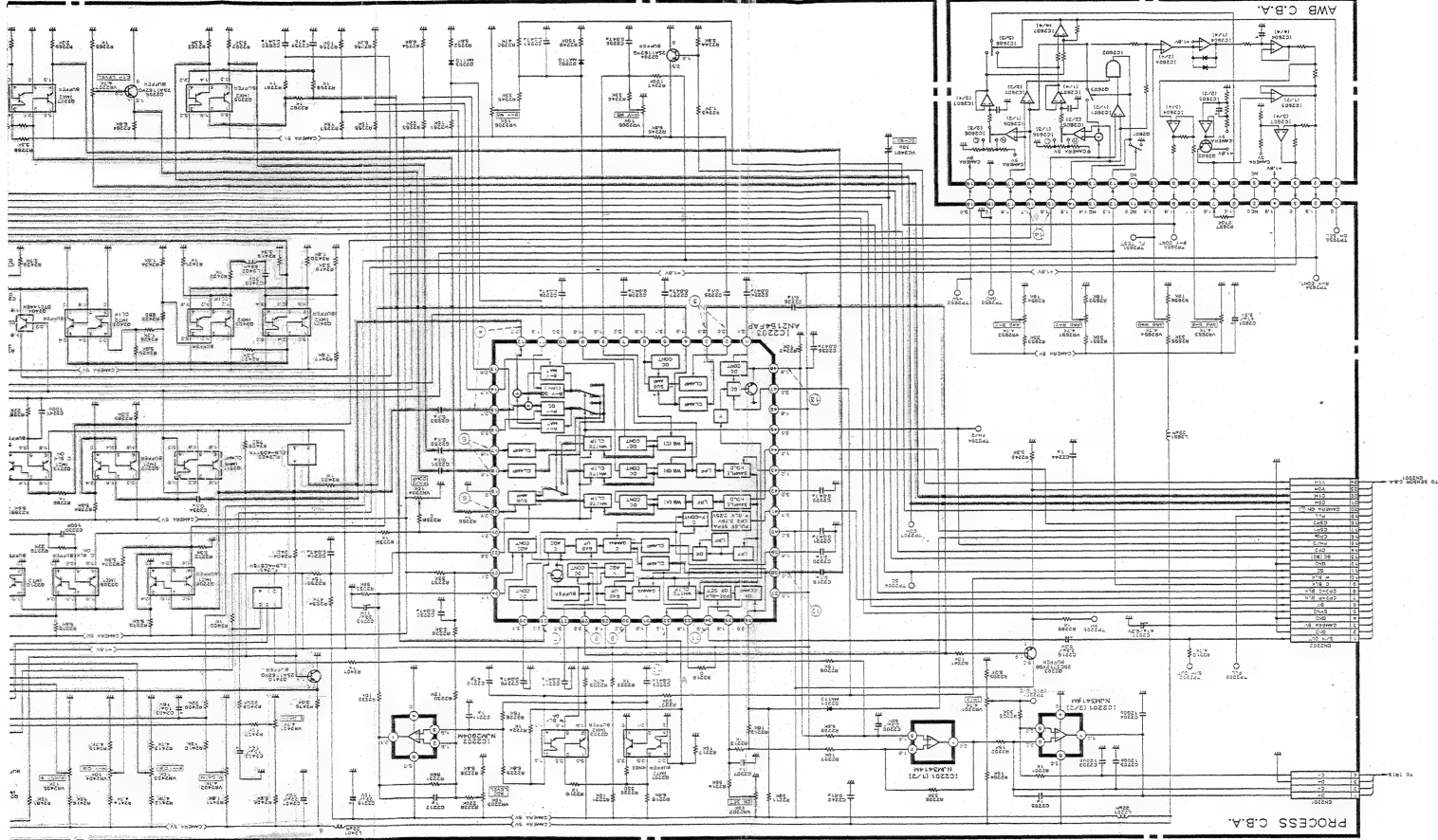
IC2931 IC2941

ENCORDER C.B.A.

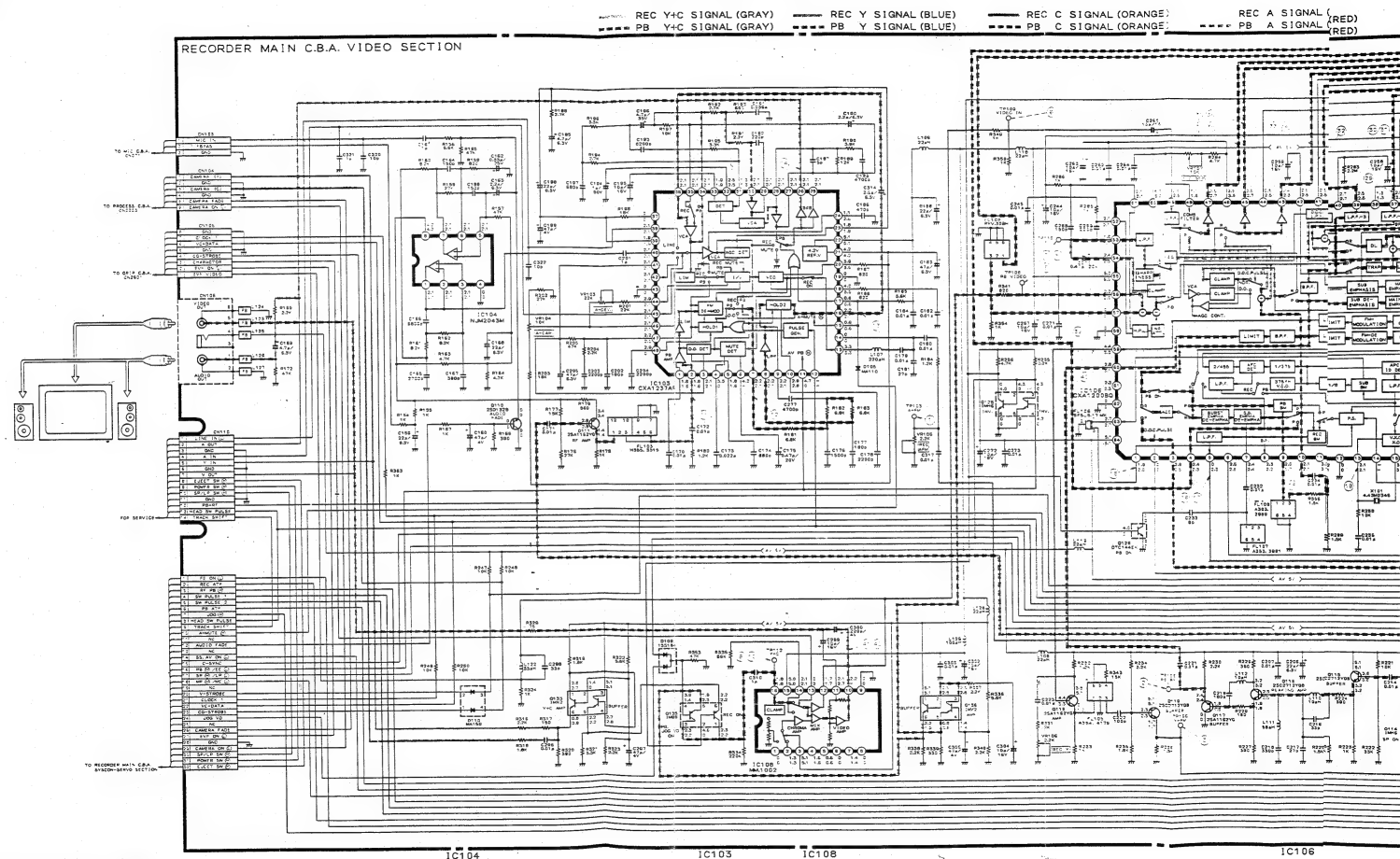


SCHEMATIC DIAGRAM PROCESS C.B.A.

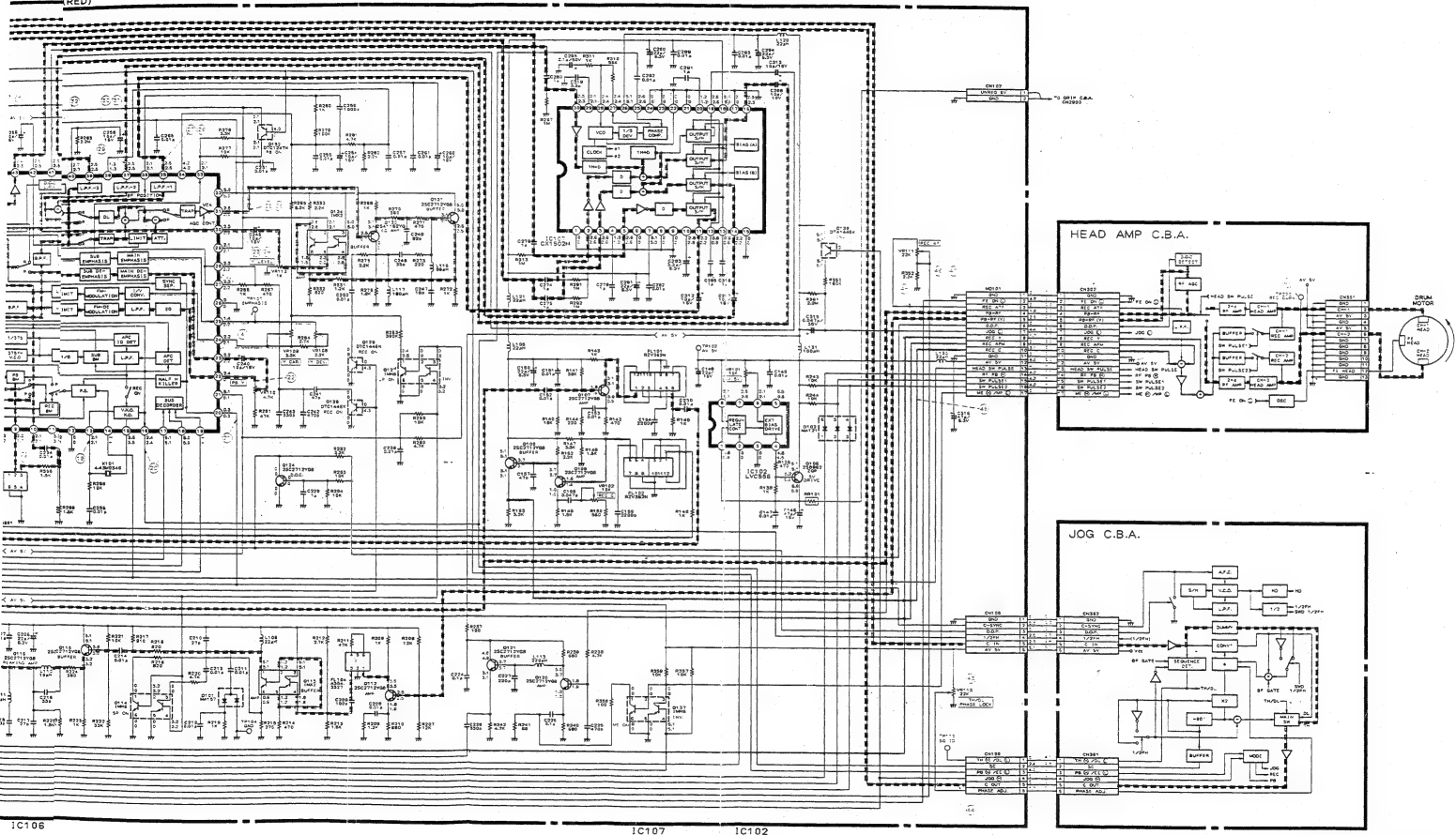
Y+C SIGNAL (GRAY) — C SIGNAL (BLUE) — Y SIGNAL (BLUE)



SCHEMATIC DIAGRAM RECORDER-MAIN C.B.A. (VIDEO SECTION)



SIGNAL (RED)
SIGNAL (RED)
SIGNAL (RED)



IC106

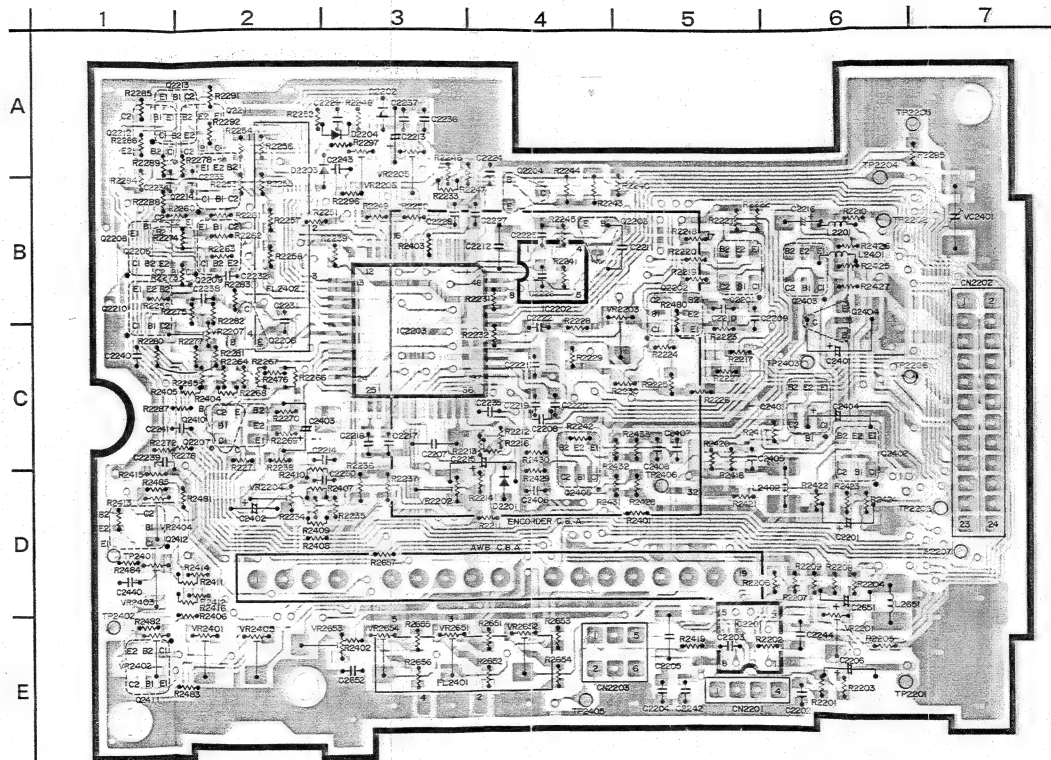
IC107

IC102

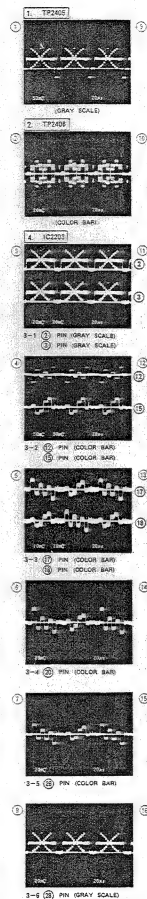
© CANON INC.
V-10

PROCESS C.B.A. (SOLDERING SIDE)

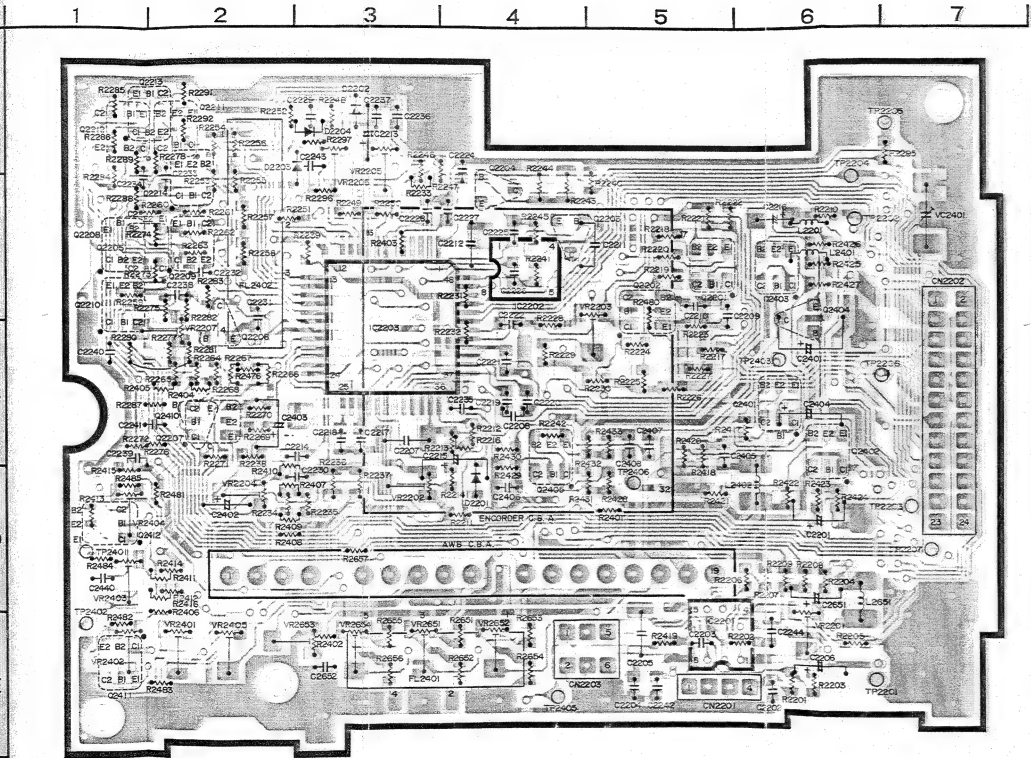
D2201	D-4
D2202	A-3
D2203	A-3
D2204	A-3
C2201	E-5
C2202	B-4
C2203	C-3
Q2201	B-5
Q2202	B-5
Q2203	B-4
Q2204	B-4
Q2205	B-1
Q2206	C-2
Q2207	C-2
Q2208	B-1
Q2209	B-2
Q2210	B-1
Q2211	A-2
Q2212	A-1
Q2213	A-1
Q2214	B-2
Q2401	C-6
Q2402	C-6
Q2403	B-6
Q2404	B-6
Q2405	C-4
Q2410	C-2
Q2411	E-1
Q2412	D-1



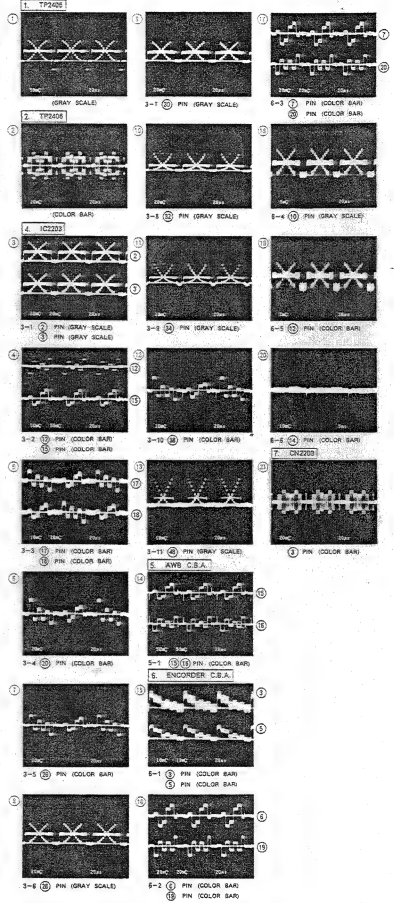
SIGNAL W



A. (SOLDERING SIDE)

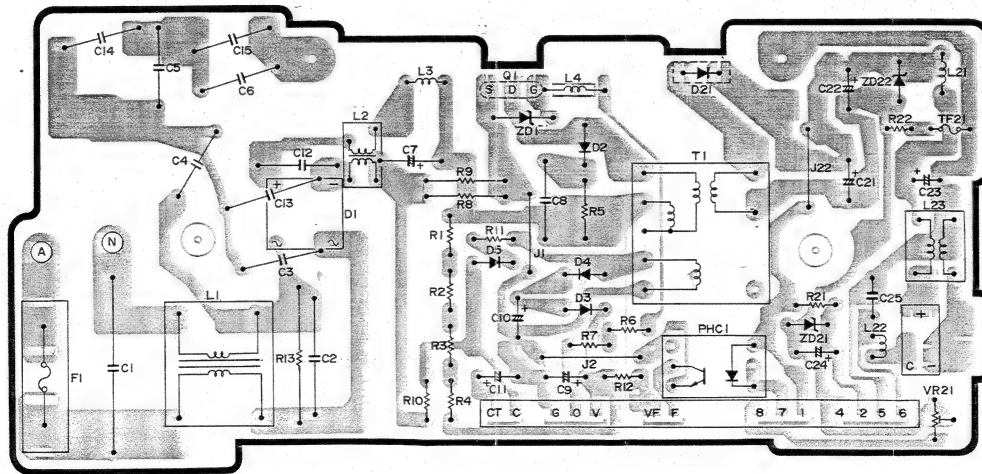
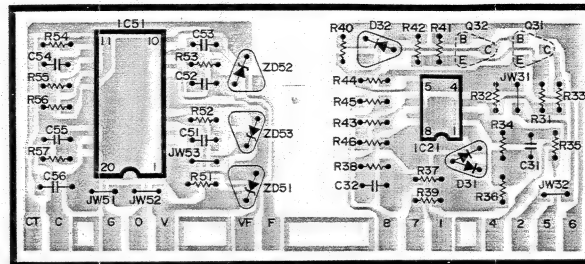


SIGNAL WAVEFORMS



01 Oct. 1989
IV-7

CA-E7E, E7B, E7AS CIRCUIT BOARD DIAGRAM



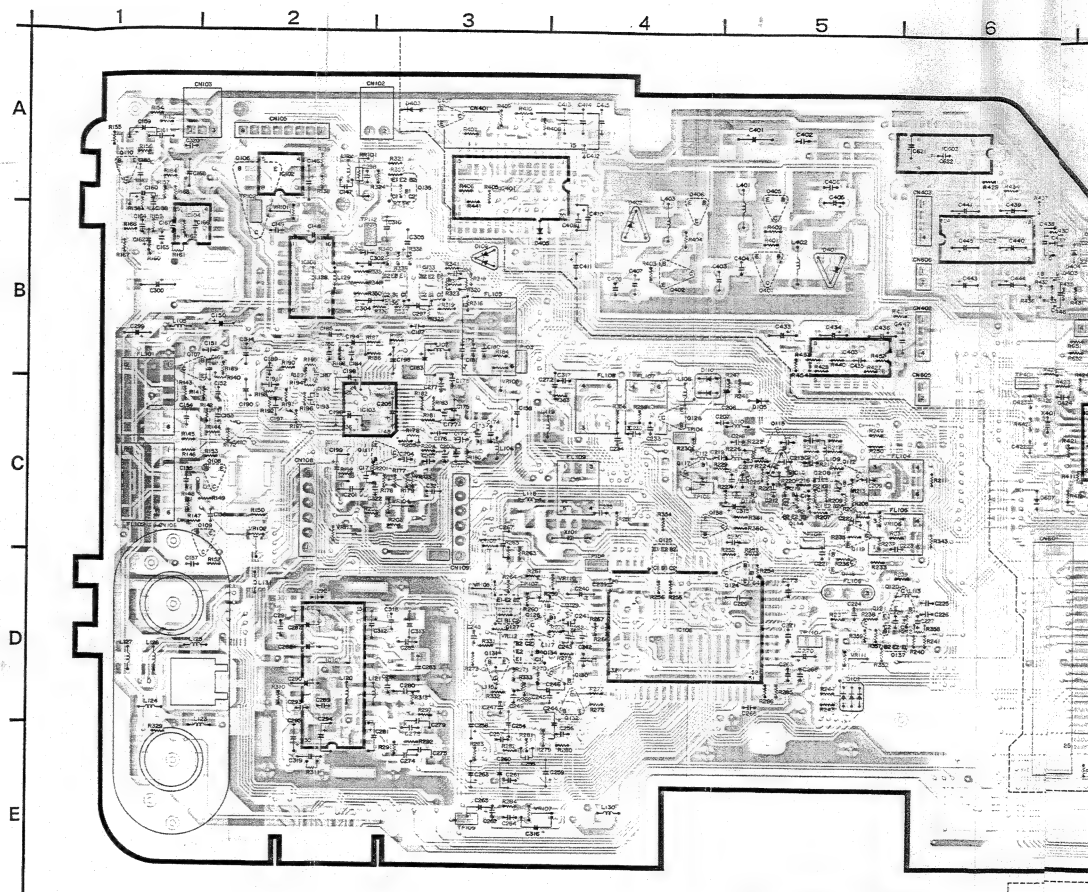


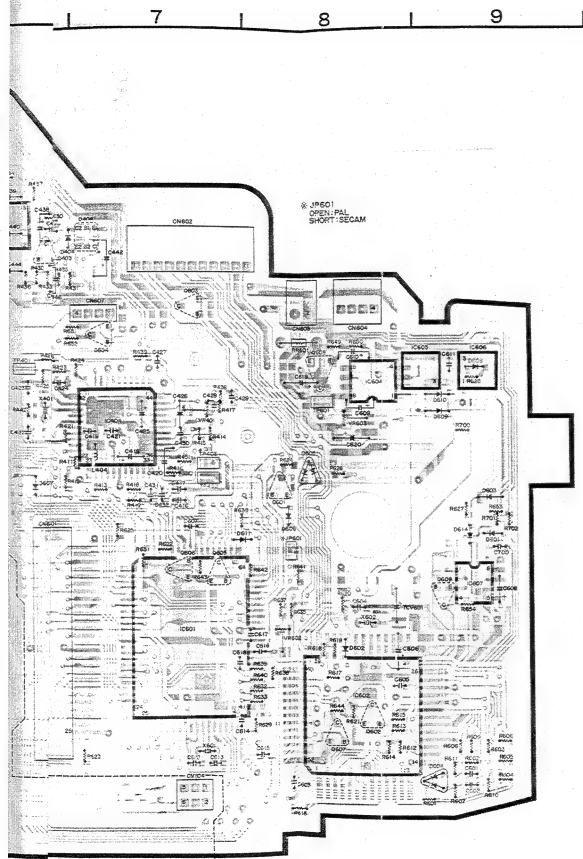
CIRCUIT BOARD DIAGRAM RECORDER-MAIN C.B.A.

RECORDER MAIN C.B.A.
(SOLDERING SIDE)

D101	C-5
D102	D-5
D105	C-5
D109	B-3
D110	C-4
D401	B-5
D402	B-4
D403	A-3
D404	B-7
D405	B-3
D601	C-9
D602	D-8
D603	C-8
D604	E-9
D605	C-8
D606	C-8
D607	C-6
D608	B-9
D609	C-9
D610	C-9
D611	C-7
D614	C-9
IC102	A-2
IC103	C-2
IC104	B-1
IC106	D-4
IC107	D-2
IC108	B-2
IC401	A-3
IC402	B-6
IC403	B-5
IC404	C-7
IC501	D-7
IC502	D-8
IC503	A-6
IC604	C-8
IC605	B-8
IC606	B-8
IC607	D-8
Q106	A-2
Q107	B-1
Q108	C-2
Q109	C-2
Q110	A-1
Q111	C-3
Q112	C-5
Q113	C-5
Q114	C-5
Q115	C-5
Q116	C-5

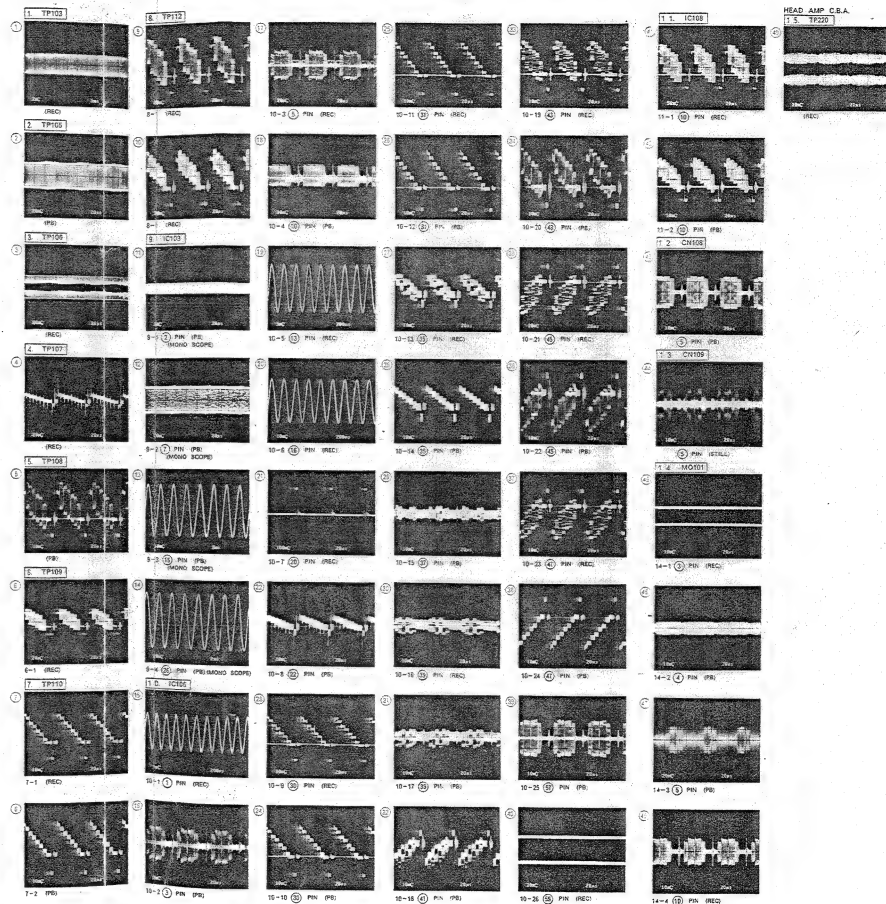
Q117	C-4
Q118	D-5
Q119	C-5
Q120	D-6
Q121	D-5
Q124	D-5
Q125	D-4
Q126	C-4
Q127	D-3
Q128	D-3
Q129	D-4
Q130	D-4
Q131	D-3
Q132	D-4
Q133	B-3
Q134	D-3
Q135	A-3
Q136	B-3
Q137	D-5
Q138	C-4
Q401	B-5
Q402	B-4
Q403	B-6
Q404	B-7
Q405	B-5
Q406	B-4
Q407	A-3
Q601	C-8
Q602	D-8
Q603	B-7
Q604	B-7
Q605	D-7
Q606	D-7
Q607	E-8
Q608	B-8
Q609	D-9





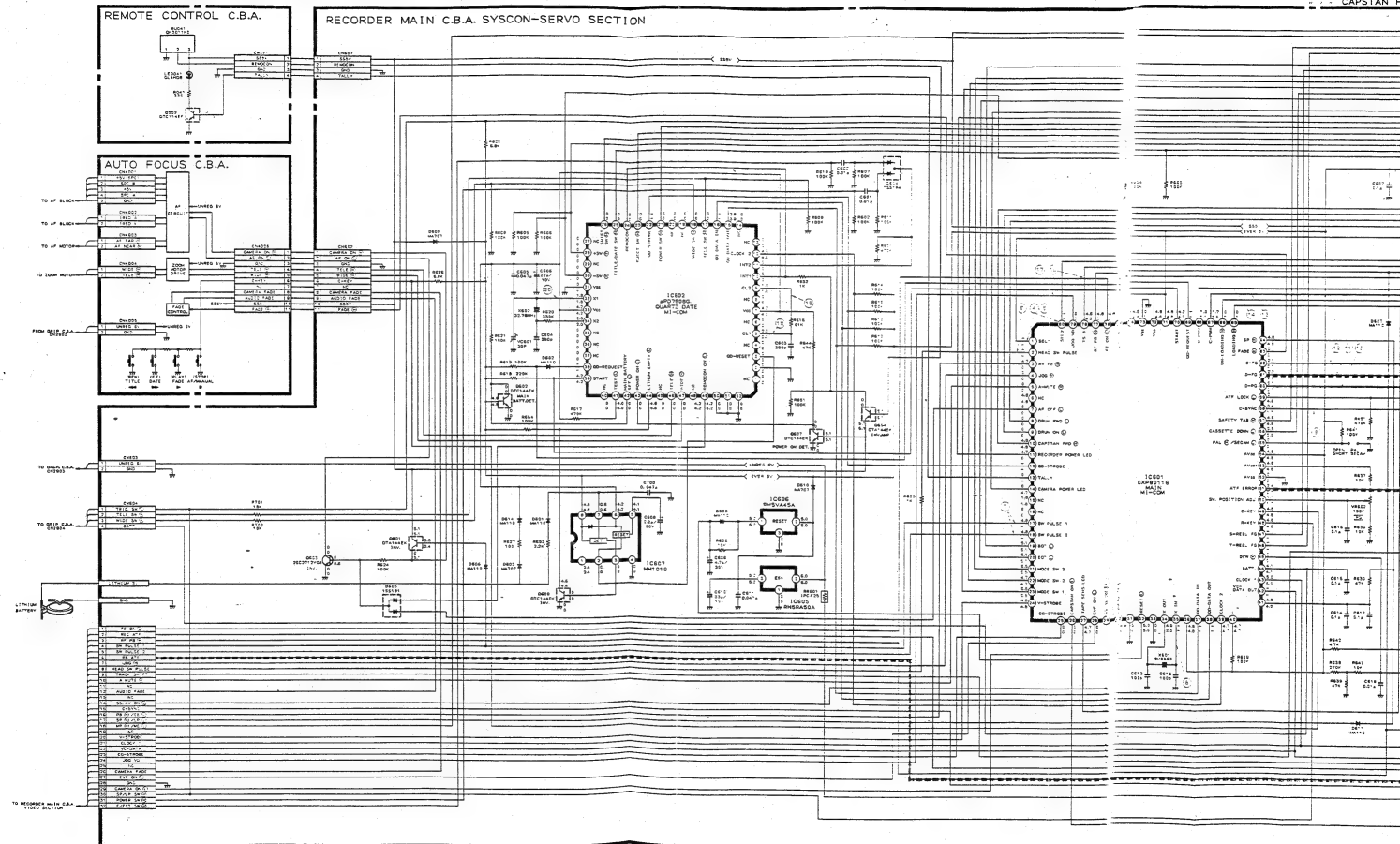
SYSCON-SERVO SECTION

SIGNAL WAVEFORMS



SCHEMATIC DIAGRAM RECORDER-MAIN C.B.A. [SYSCON-SERVO SECTION]

○ SIGNAL PATH
 --- CAPSTAN PV
 --- CAPSTAN AT
 --- CAPSTAN F

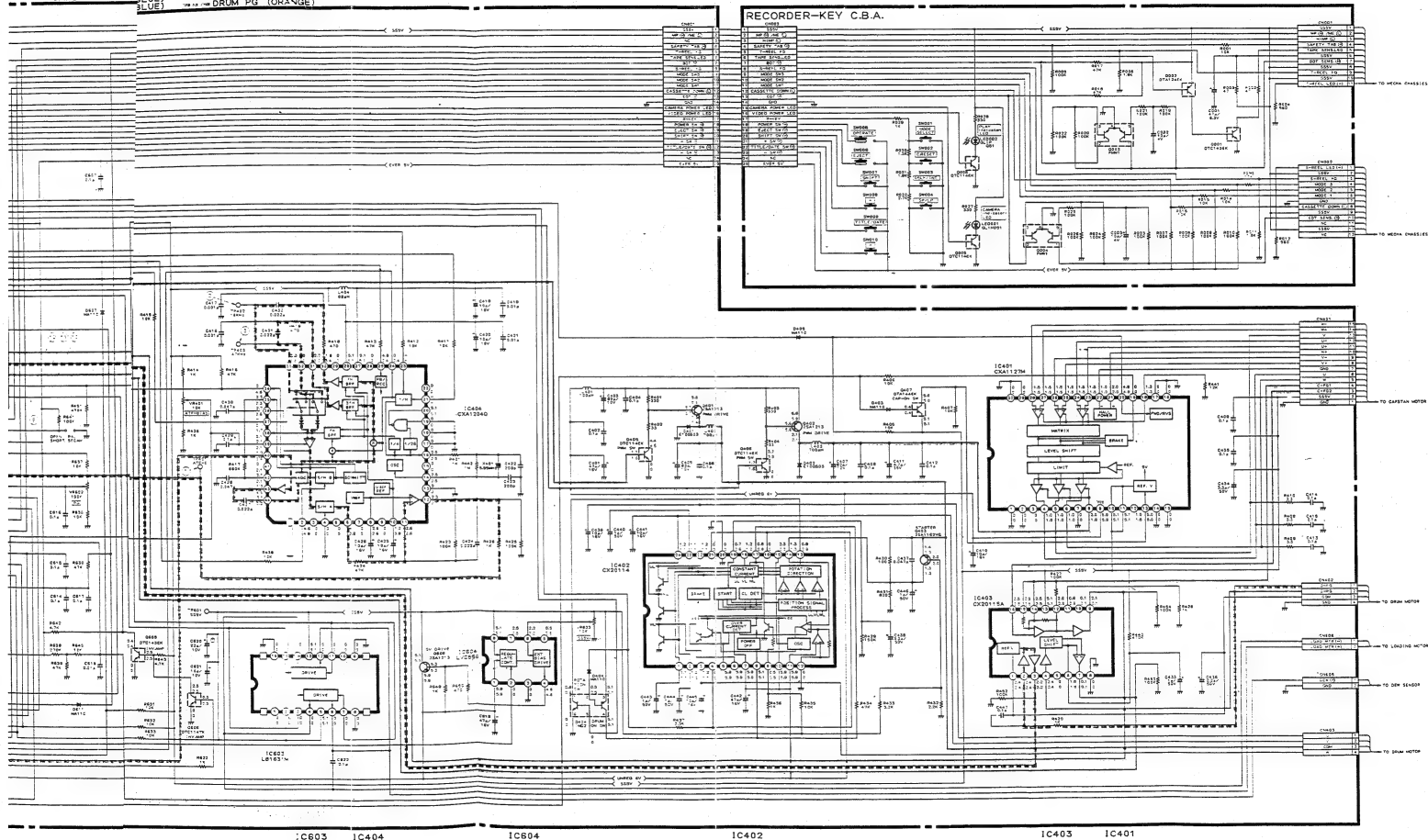


IC607 IC602

IC608 IC605

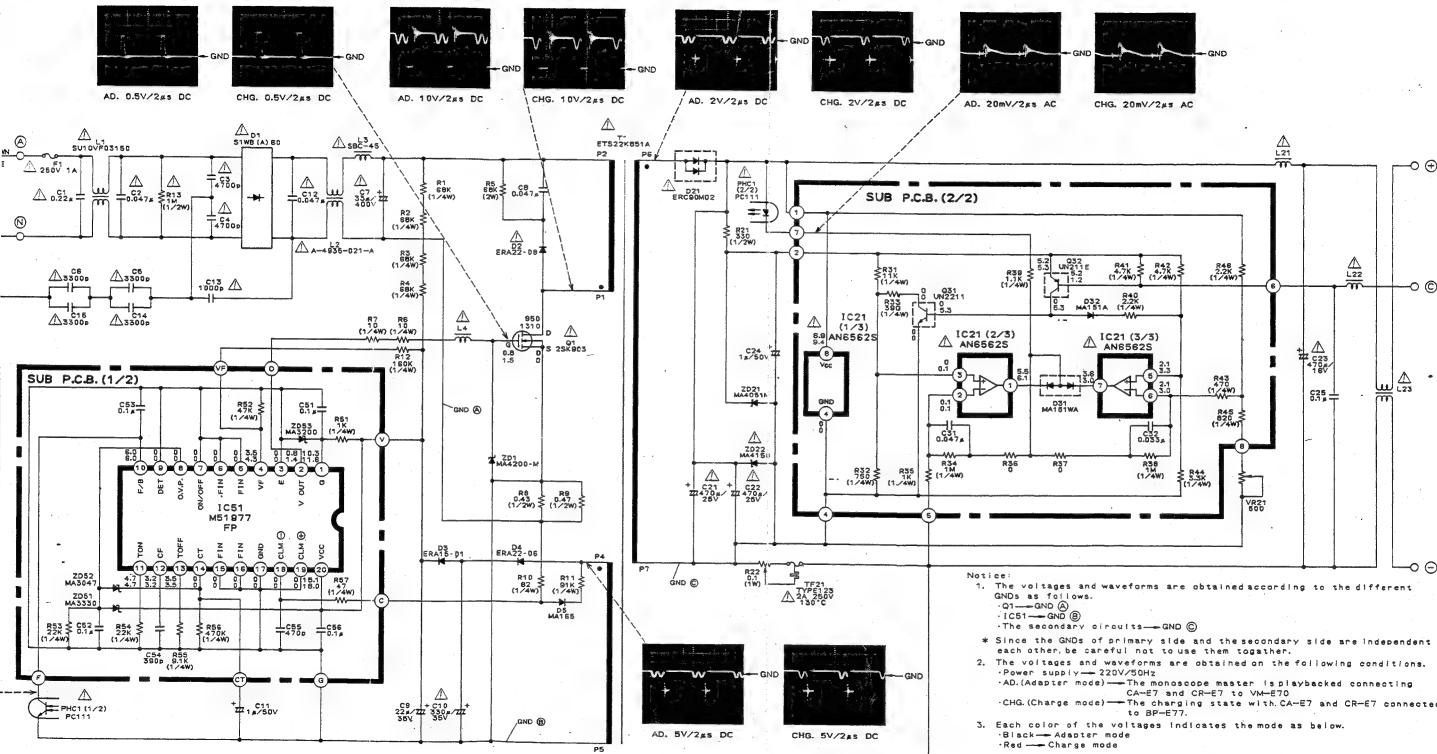
IC601

CAPSTAN PWM (B)
 CAPSTAN ATF (B)
 CAPSTAN FG (B)
 DRUM PWM (ORANGE)
 DRUM FG (ORANGE)
 DRUM PG (ORANGE)





7AS SCHEMATIC DIAGRAM

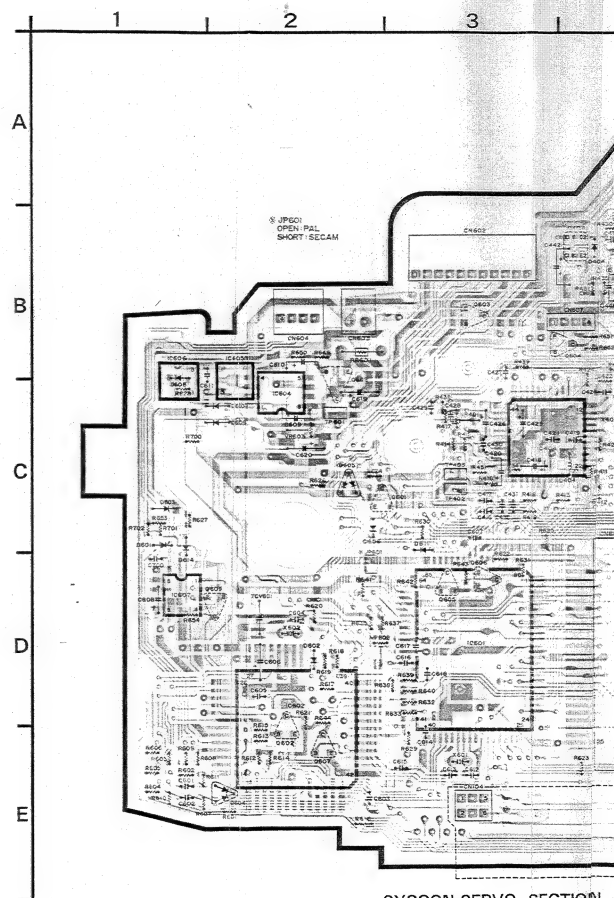


- Notices:
- The voltages and waveforms are obtained according to the different GNDs as follows.
 - 1—GND ①
 - 2—GND ②
 - 3—GND ③
 - 4—GND ④
 - 5—GND ⑤
 - 6—GND ⑥
 - 7—GND ⑦
 - 8—GND ⑧
 - 9—GND ⑨
 - 10—GND ⑩
 - 11—GND ⑪
 - 12—GND ⑫
 - 13—GND ⑬
 - 14—GND ⑭
 - 15—GND ⑮
 - 16—GND ⑯
 - 17—GND ⑰
 - 18—GND ⑱
 - 19—GND ⑲
 - 20—GND ⑳
 - 21—GND ㉑
 - 22—GND ㉒
 - 23—GND ㉓
 - 24—GND ㉔
 - 25—GND ㉕
 - 26—GND ㉖
 - 27—GND ㉗
 - 28—GND ㉘
 - 29—GND ㉙
 - 30—GND ㉚
 - 31—GND ㉛
 - 32—GND ㉜
 - 33—GND ㉝
 - 34—GND ㉞
 - 35—GND ㉟
 - 36—GND ㊱
 - 37—GND ㊲
 - 38—GND ㊳
 - 39—GND ㊴
 - 40—GND ㊵
 - 41—GND ㊶
 - 42—GND ㊷
 - 43—GND ㊸
 - 44—GND ㊹
 - 45—GND ㊺
 - 46—GND ㊻
 - 47—GND ㊼
 - 48—GND ㊽
 - 49—GND ㊾
 - 50—GND ㊿
 - 51—GND ①
 - 52—GND ②
 - 53—GND ③
 - 54—GND ④
 - 55—GND ⑤
 - 56—GND ⑥
 - 57—GND ⑦
 - 58—GND ⑧
 - 59—GND ⑨
 - 60—GND ⑩
 - 61—GND ⑪
 - 62—GND ⑫
 - 63—GND ⑬
 - 64—GND ⑭
 - 65—GND ⑮
 - 66—GND ⑯
 - 67—GND ⑰
 - 68—GND ⑱
 - 69—GND ⑲
 - 70—GND ⑳
 - 71—GND ㉑
 - 72—GND ㉒
 - 73—GND ㉓
 - 74—GND ㉔
 - 75—GND ㉕
 - 76—GND ㉖
 - 77—GND ㉗
 - 78—GND ㉘
 - 79—GND ㉙
 - 80—GND ㉚
 - 81—GND ㉛
 - 82—GND ㉜
 - 83—GND ㉝
 - 84—GND ㉞
 - 85—GND ㉟
 - 86—GND ㊱
 - 87—GND ㊲
 - 88—GND ㊳
 - 89—GND ㊴
 - 90—GND ㊵
 - 91—GND ㊶
 - 92—GND ㊷
 - 93—GND ㊸
 - 94—GND ㊹
 - 95—GND ㊺
 - 96—GND ㊻
 - 97—GND ㊼
 - 98—GND ㊽
 - 99—GND ㊾
 - 100—GND ㊿
 - Since the GNDs of primary side and the secondary side are independent each other, be careful not to use them together.
 - The voltages and waveforms are obtained on the following conditions.
 - Power supply—220V/50Hz
 - AD (Adapter mode)—The monoscope master is played back connecting CA-E7 and CR-E7 to VM-E7D
 - CHG (Charge mode)—The charging state with CA-E7 and CR-E7 connected to BP-E77.
 - Each color of the voltages indicates the mode as below.
 - Black—Adapter mode
 - Red—Charge mode
 - Disconnect the GND terminal of oscilloscope and the GND terminal of AC outlets.
 - Waveforms and voltages are typical values, not absolute standards. Voltage is measured by a digital voltmeter. Waveforms are observed by using a 10:1 probe.
 - * Specifications are subject to change without notice for further improvement.

CIRCUIT BOARD DIAGRAM RECORDER-MAIN C.B.A.

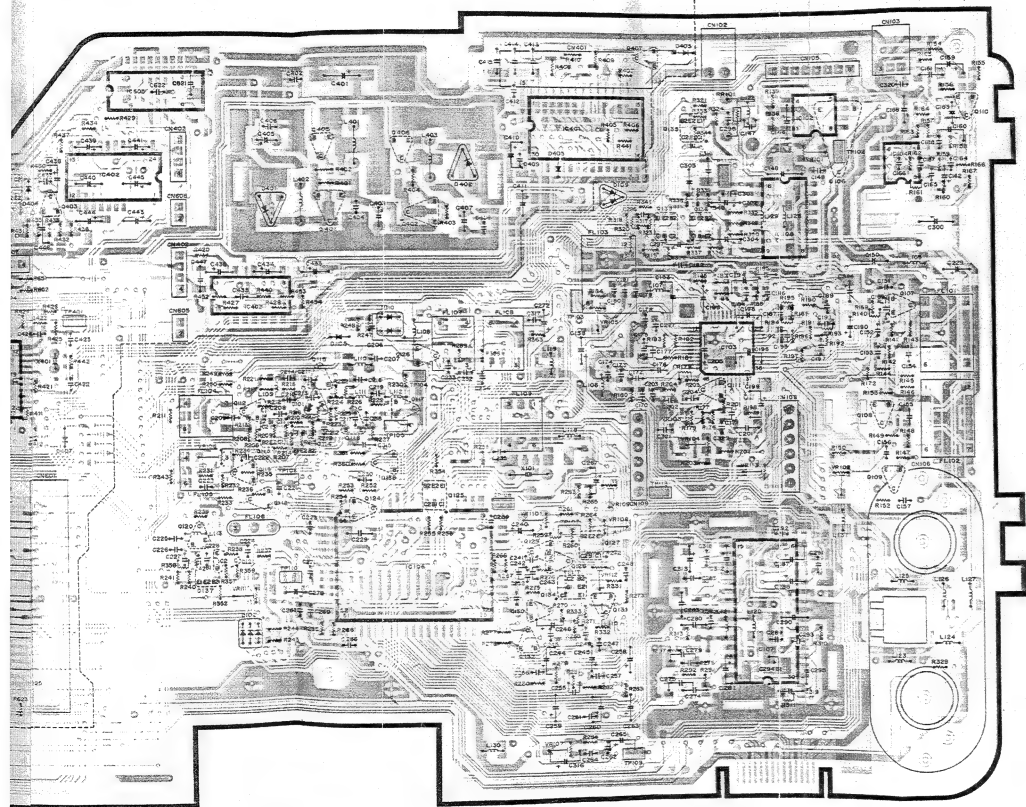
RECORDER MAIN C.B.A. (COMPONENT SIDE)

D101	C-5	Q117	C-6
D102	D-5	Q118	D-5
D105	C-5	Q119	C-5
D109	B-7	Q120	D-5
D110	C-6	Q121	D-5
D401	B-5	Q124	D-6
D402	B-6	Q125	D-6
D403	A-7	Q126	C-6
D404	B-4	Q127	D-7
D405	B-7	Q128	D-7
D601	C-1	Q129	D-7
D602	D-2	Q130	D-7
D603	C-1	Q131	D-7
D604	E-2	Q132	D-7
D605	C-2	Q133	B-7
D606	C-2	Q134	D-7
D607	C-4	Q135	A-8
D608	B-1	Q136	B-8
D609	C-2	Q137	D-5
D610	C-2	Q138	C-6
D611	C-3	Q401	B-5
D614	C-1	Q402	B-6
IC102	A-8	Q403	B-4
IC103	C-8	Q404	B-4
IC104	B-9	Q405	A-5
IC106	D-6	Q406	B-6
IC107	D-8	Q407	A-7
IC108	B-8	Q601	C-2
IC401	A-7	Q602	E-2
IC402	B-4	Q603	B-3
IC403	B-5	Q604	B-4
IC404	C-3	Q605	D-3
IC601	D-3	Q606	D-3
IC602	D-2	Q607	E-2
IC603	A-4	Q608	C-2
IC604	C-2	Q609	D-2
IC605	B-2		
IC606	B-1		
IC607	D-1		
Q106	A-8		
Q107	B-9		
Q108	C-9		
Q109	C-9		
Q110	A-8		
Q111	C-8		
Q112	C-5		
Q113	C-5		
Q114	C-5		
Q115	C-5		
Q116	C-6		



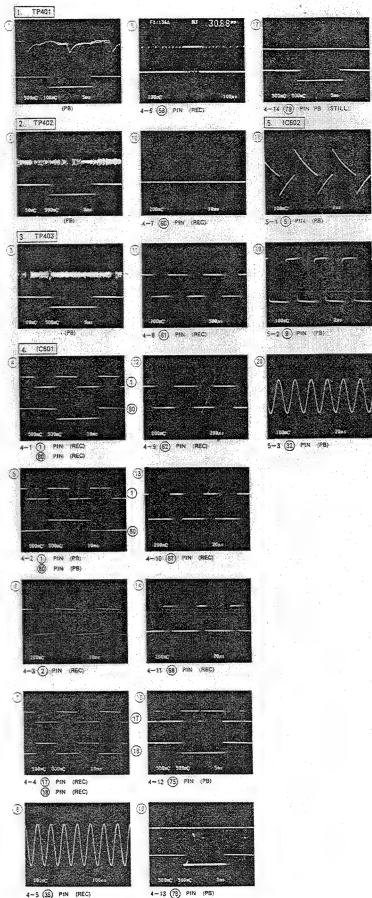
SYSCON-SERVO SECTION

4 | 5 | 6 | 7 | 8 | 9



AUDIO-VIDEO SECTION

SIGNAL WAVEFORMS



Canovision 8

SERVICE MANUAL

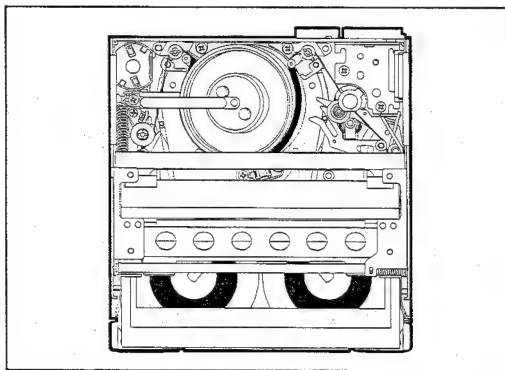
MC-4B

MECHANICAL CHASSIS

NTSC

PAL

SECAM



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Video Technical Service Dept.
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Chapter 1 Operations

1. Main Parts in Mechanical Section

1-1 Locations and Nomenclatures

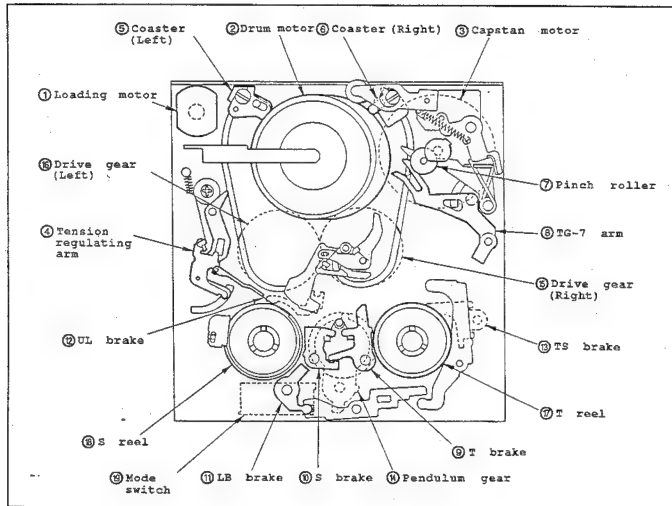


Fig. I-1

1-2 Relationships between Each Mode and Mode Switch

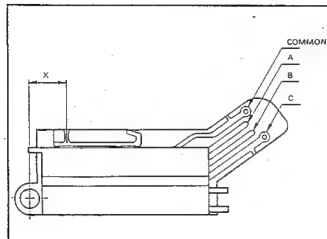


Fig. I-2

Modes	X (mm)	A	B	C
Eject	1.7-2.7	opened	opened	shorted
Blank	2.7-5.7	opened	opened	opened
Load/Unload	5.7-6.7	opened	shorted	shorted
Blank	6.7-8.1	opened	shorted	opened
Stop	8.1-9.1	shorted	shorted	opened
Blank	9.1-12.0	shorted	opened	opened
Play	12.0-13.3	shorted	opened	shorted

Table I-1

Note: "Opened" and "Shorted" in the table is versus the COMMON.

2.Operation in Each Section

2-1 Gear Train

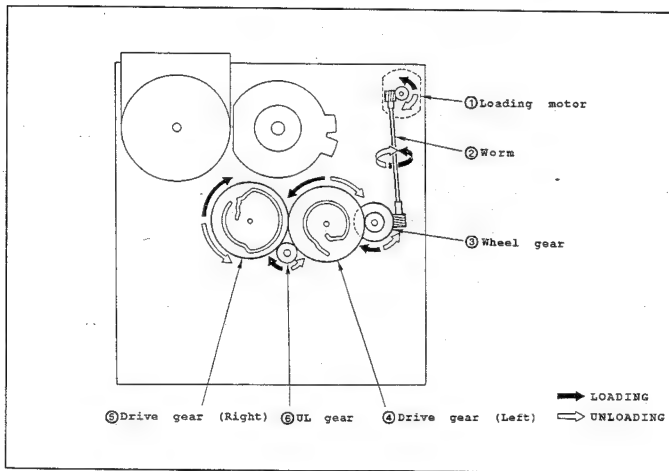
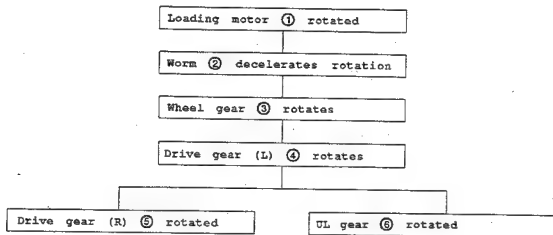


Fig.I-3

2-2 Mode SW, Eject Lever, UL Brake

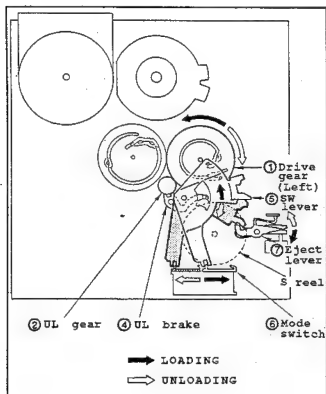
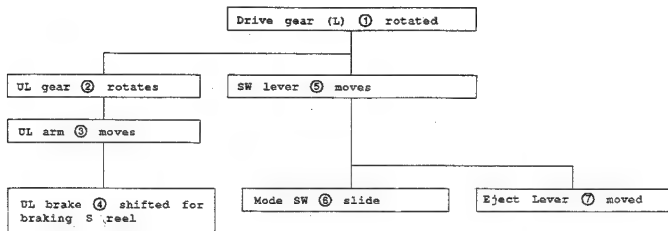


Fig.I-4

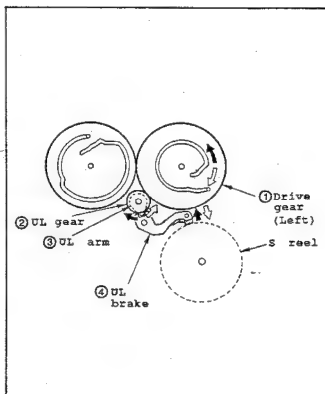


Fig.I-5

2-3 TS Brake, LB Brake

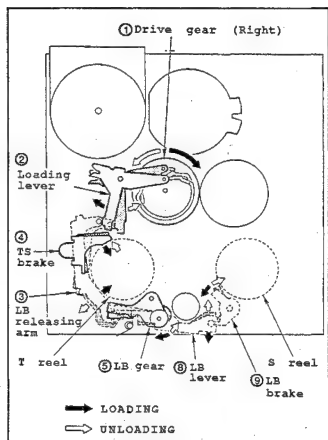
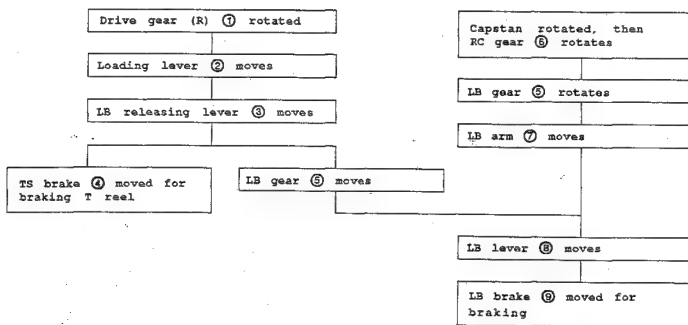


Fig. I-6

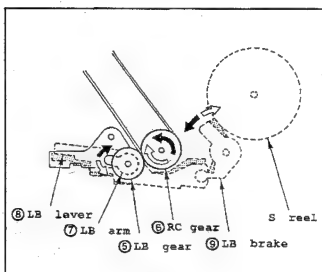


Fig. I-7

2-4 T Brake, S Brake

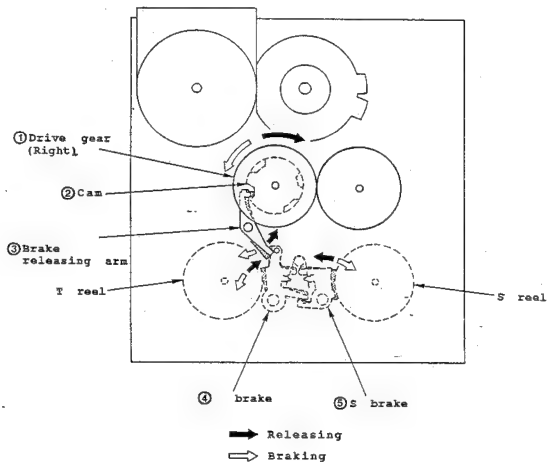
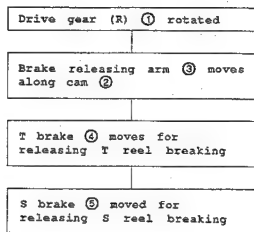


Fig. I-8

2-5 Tension Regulator Arm, Pinch Arm (Pinch Roller)

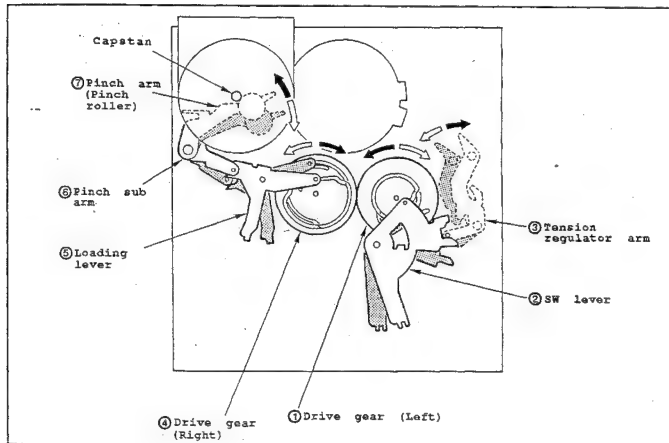
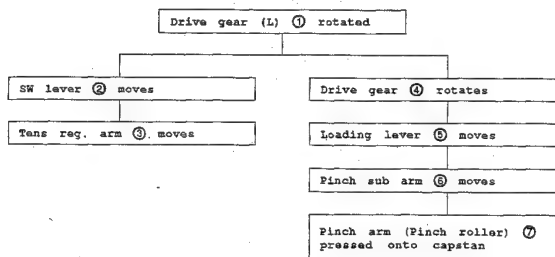


Fig. I-9

2-6 Coasters (Right/Left)

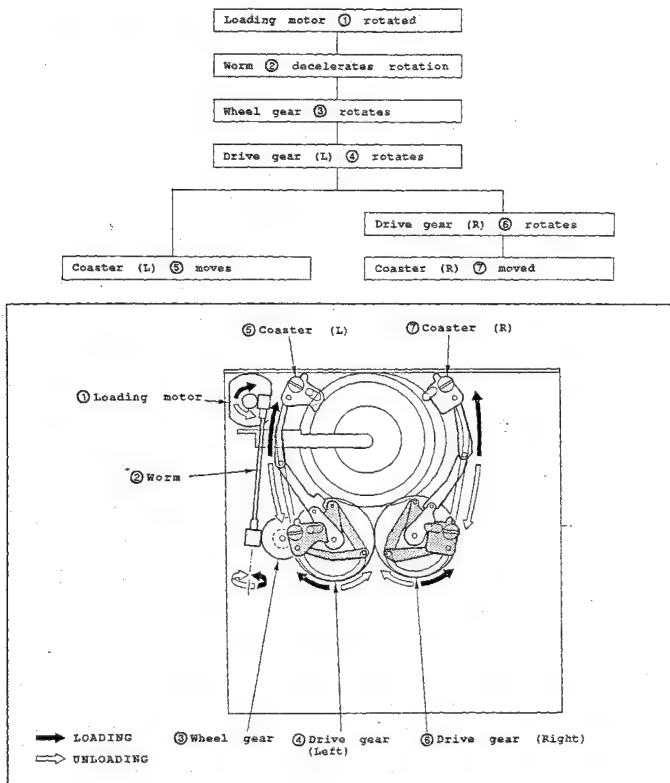


Fig. I-10

2-7 Reel Tables (Take-up/Supply)

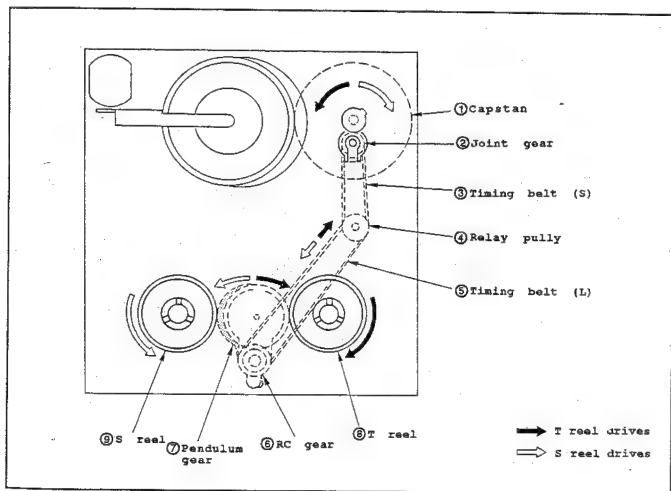
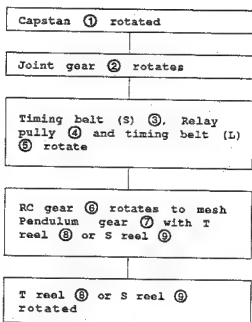


Fig. I-11

3. Each Mode Transition
3-1 Cassette In

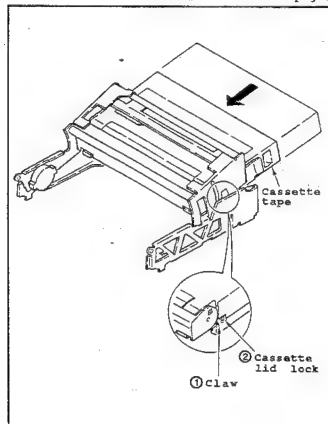
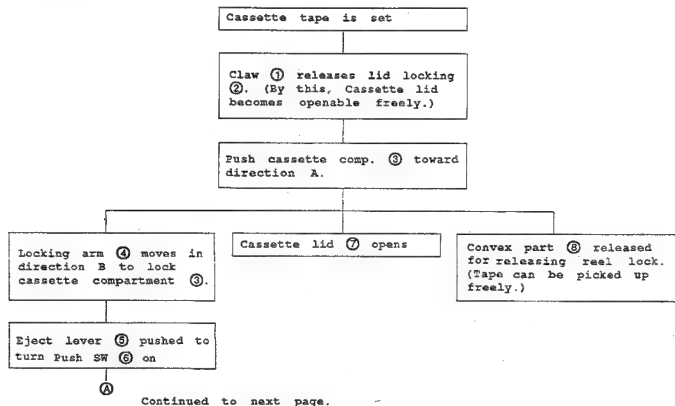


Fig. I-12

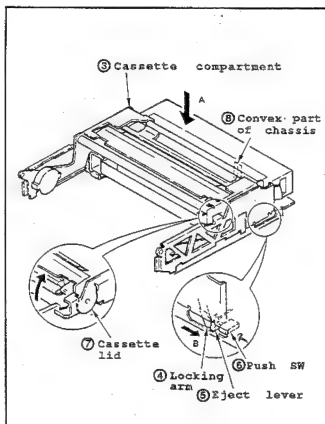


Fig. I-13

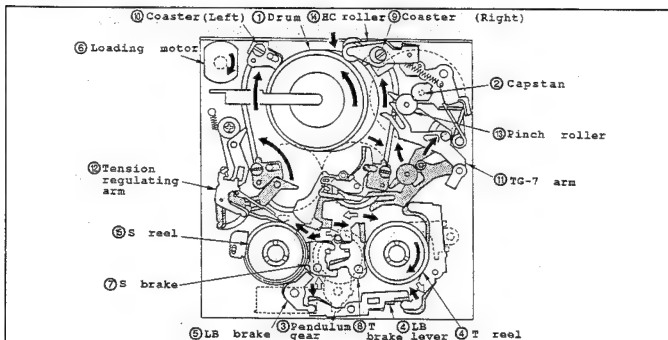
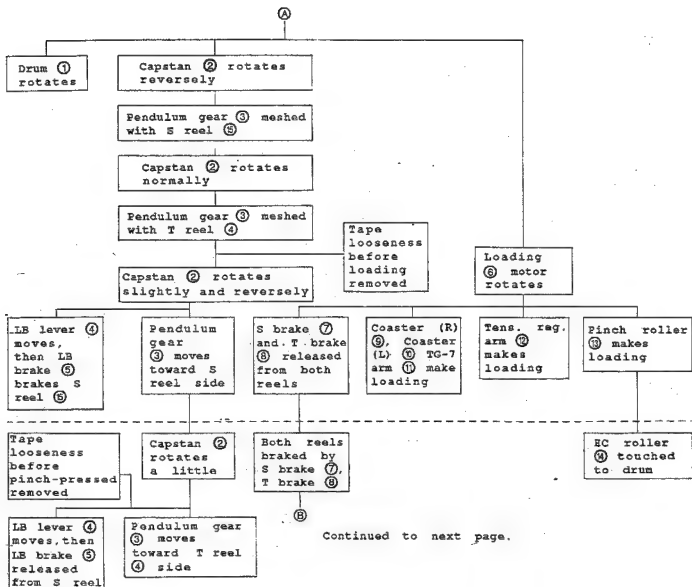


Fig. I-14

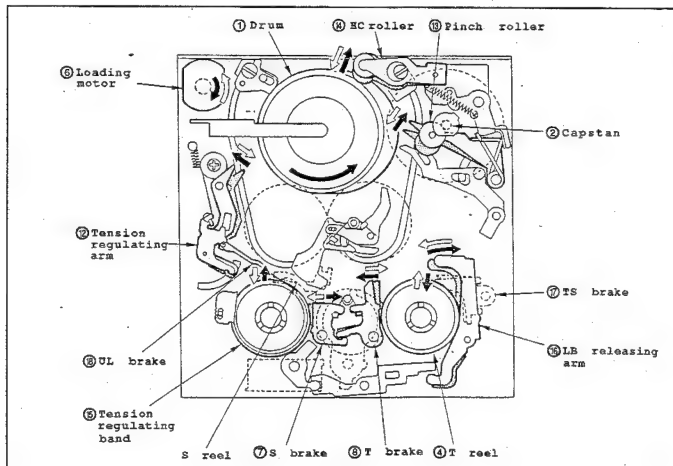
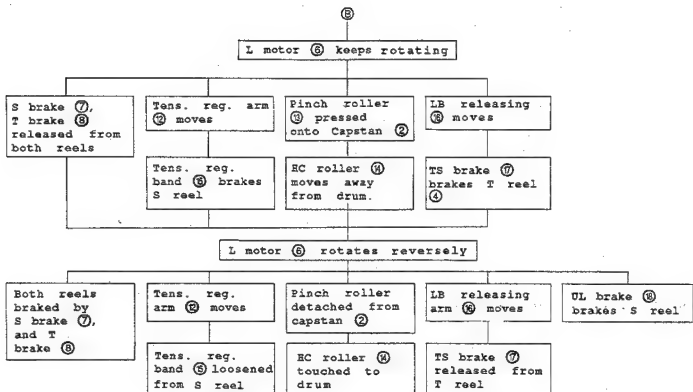


Fig. I-15

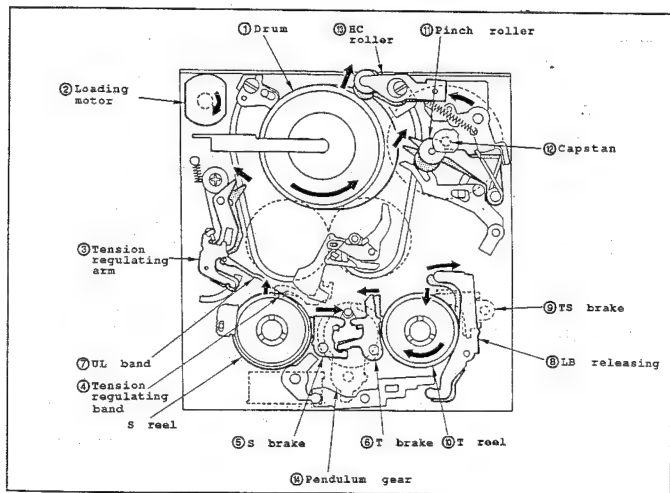
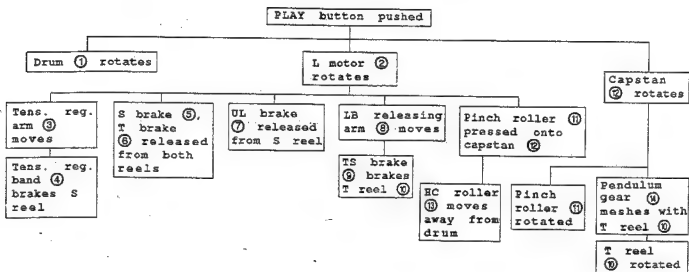


Fig. I-16

3-3 Tape Path

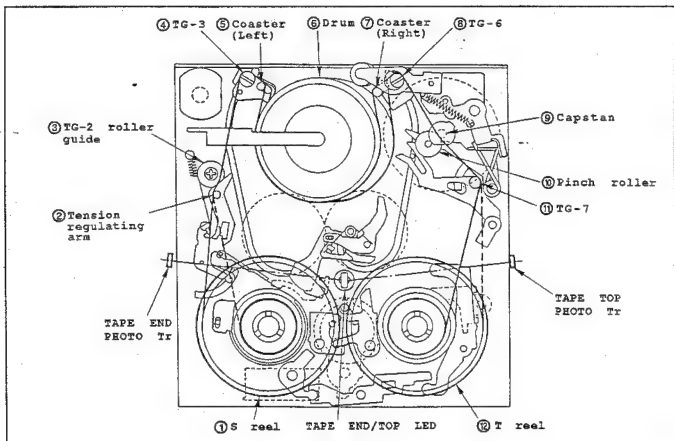
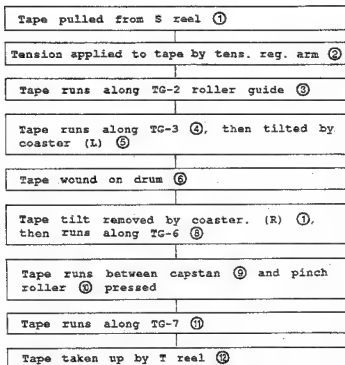


Fig. I-17

3-4 Pause

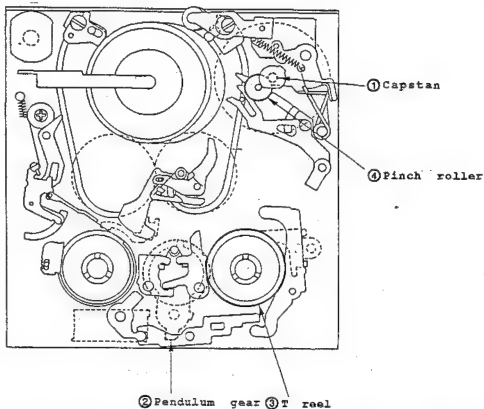
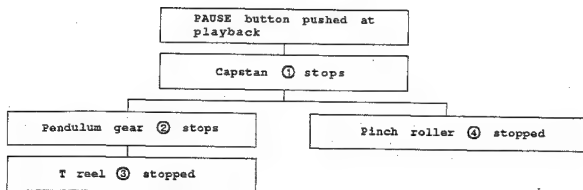


Fig. I-18

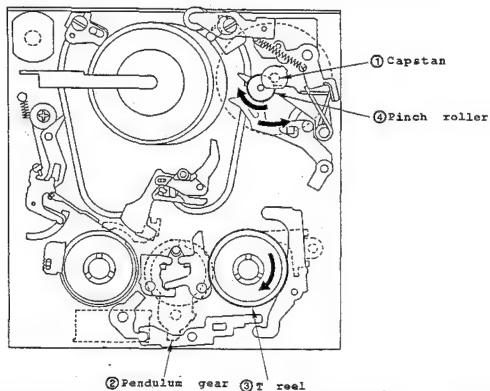
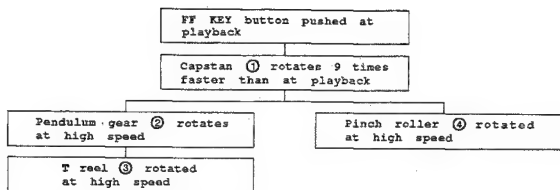


Fig.I-19

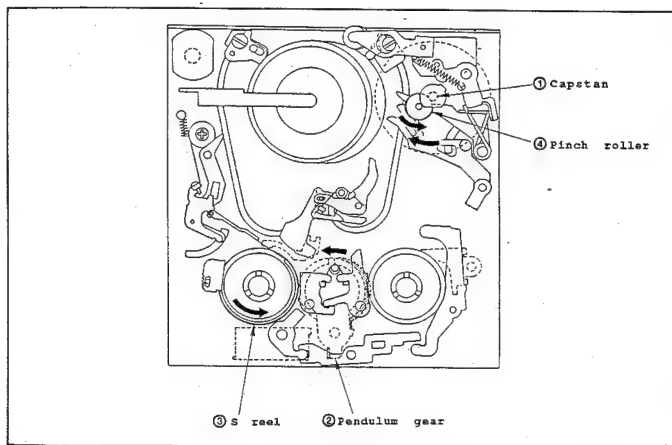
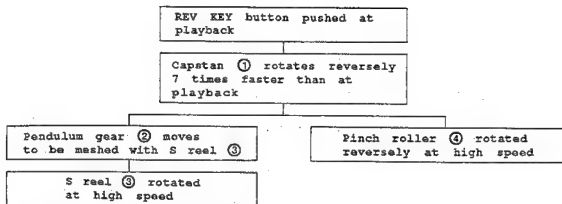


Fig. I-20

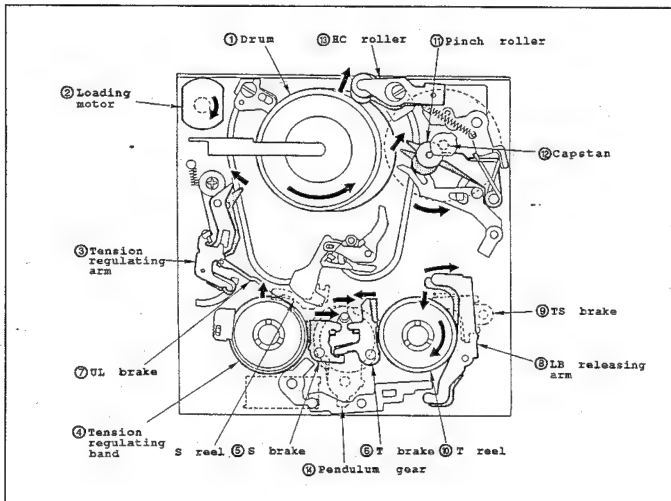
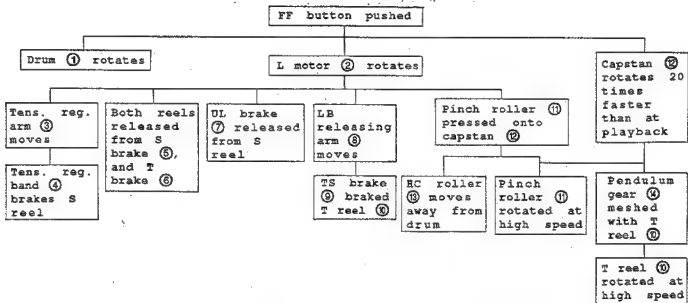


Fig. I-21

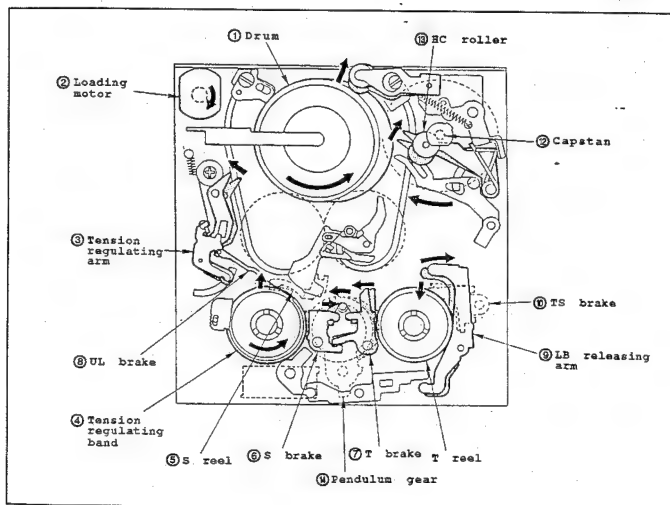
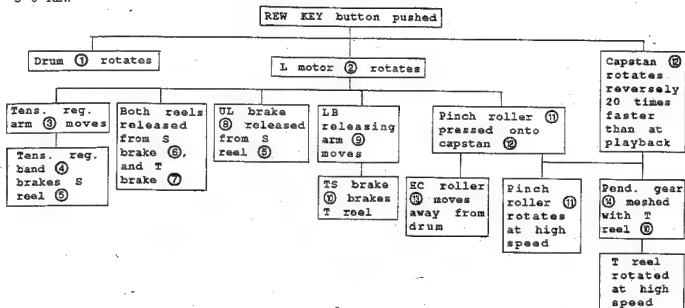


Fig.I-22

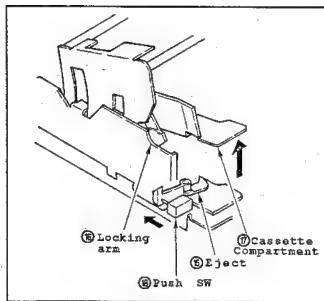
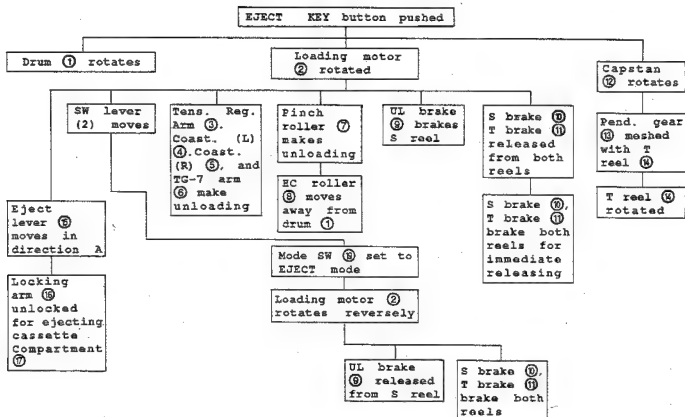


Fig. I-23

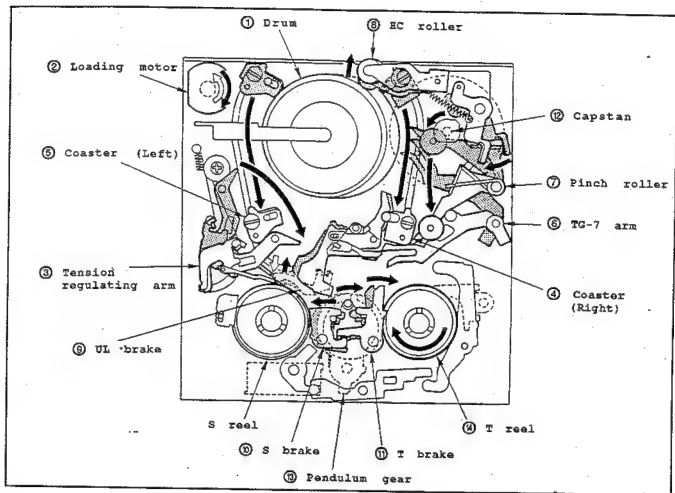


Fig. I-24

Chapter 2 Adjustments/Replacement

1. Recorder Section Mechanical Check/Adjustment

*Note: For details, i.e. removal of covers, C.B.A.S., location of test points, etc., refer to the service manual of product which equips this mechanism.

1-1 List of Maintenance Tools and Supplies

Maintenance Tools

Description	Tool No.	Remarks
Cassette Torque Gauge for 8mm	DY9-1047-000	
Alignment Tape K (Tracking B)	DY9-1085-000	New (for NTSC)
Alignment Tape L (Tracking C)	DY9-1086-000	New (for PAL/SECAM)
Hexagonal wrench (0.89mm)		New (Commercially available)
Rotary drum jig kit		Enclosed in repair kit

Supplies

Description	Tool No.	Remarks
Lens Tissue K-1, K-3	CY9-4023-003	Camera Service Dept.
Molyton Grease	DY9-3009-000	
Hydroflud NT-68	DY9-3010-000	*See the note below
Ethyl alcohol		Commercially available

*Note: In U.S.A., contact video service Div., Canon U.S.A., Inc. for ordering.

1-2 Removal of cassette Compartment Assembly (Fig.II-1)

- (1) Remove setscrews ① and ②.
- (2) To detach cassette compartment assembly, slide the assembly a little toward you. (A parts in Fig.II-1 detached)
Then take out the assembly.

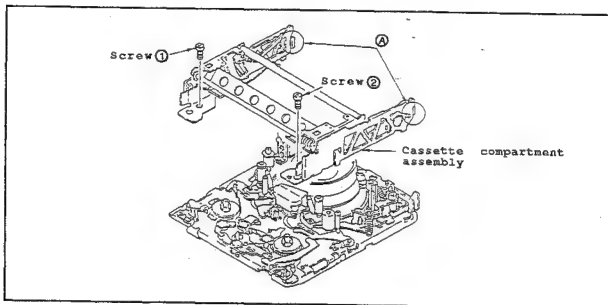


Fig.II-1

1-3 Tape Loading/Play without LS cassette Compartment Assembly and Tape

*Note: Remove a strong light source when performing the followings.
If performed near the strong light source, a tape sensor misoperated.

1-3-1 Loading (Fig.II-2)

- (1) Cover a tape sensor LED with an opaque cap ① or equivalent.
- (2) To press a pin, attach a tape onto the Recog. switch ②.
- (3) Move the Eject lever ③ in the direction of ④.

1-3-2 Play (Fig. II-2)

- (1) Set loading state.
- (2) Snap a rubber band ④ around the S and T reels.
- (3) To rotate T reel, push the play Key Switch.
When the tape starts moving, push the tension regulating arm ⑤ in the direction of ⑥. (At this time, the tension regulating band is released, and the S reel moves.)

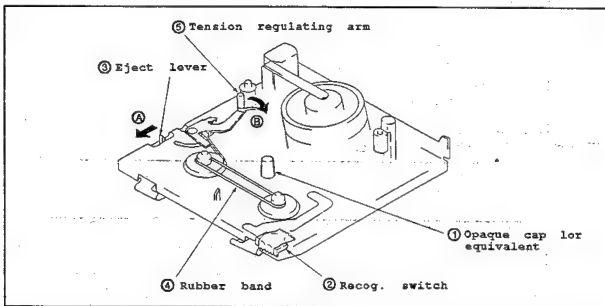


Fig.II-2

1-4 Independent Operation of Mechanism Section

*Note: Perform this operation when the C.B.A.S are removed.

- (1) To expose the terminals, remove the tape from the upper part of loading motor. (Fig.II-3)
- (2) Supply 3V (approx.) to the terminals of loading motor ① from the constant voltage supplier.
- (3) For confirming the mechanical modes, use the output of slide switch ② (mode switch). (Fig.II-4, Table II-1).

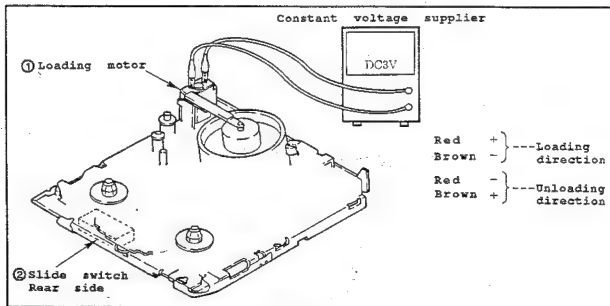


Fig.II-3

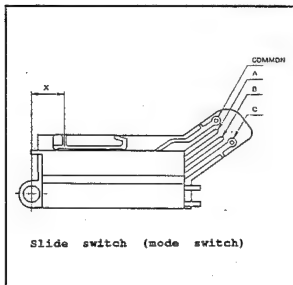


Fig.II-4

Modes	X (mm)	A	B	C
Eject	1.7-2.7	opened	opened	shorted
Blank	2.7-5.7	opened	opened	opened
Load/Unload	5.7-6.7	opened	shorted	shorted
Blank	6.7-8.1	opened	shorted	opened
Stop	8.1-9.1	shorted	shorted	opened
Blank	9.1-12.0	shorted	opened	opened
Play	12.0-13.3	shorted	opened	shorted

Note: "Opened" and "shorted" in the table is versus the COMMON.

Table II-1

2. Periodic Check/Confirmation and Notes for Each Mechanism

To maintain the performances of equipment and tape properly, perform the following checks periodically. Also, after repairing, confirm the followings regardless of the length of use hours.

• Cleaning

2-1 Rotary Drum

- (1) Clean the rotary drum gently with a thick lens tissue (CY9-4023-003) with ethyl alcohol wetted.

When cleaning, rotate the rotary drum counterclockwise gradually by hand.

*Notes: 1. Do not rotate the motor by using the power source.

2. Do not rotate the drum clockwise.

3. Do not clean the drum except the above procedure.

If the lens tissue with ethyl alcohol soaked is used vertically to head chip, the head chip may be damaged.

2-2 Tape Path

- (1) Clean the tape path (No.1-7 guides, Capstan shaft and Pinch roller) by using a lens tissue with ethyl alcohol soaked. (Fig.II-5)

2-3 Driving System (Timing belt, surface of reel table)

- (1) Clean the timing belt and the reel table by using a lens tissue with ethyl alcohol soaked.

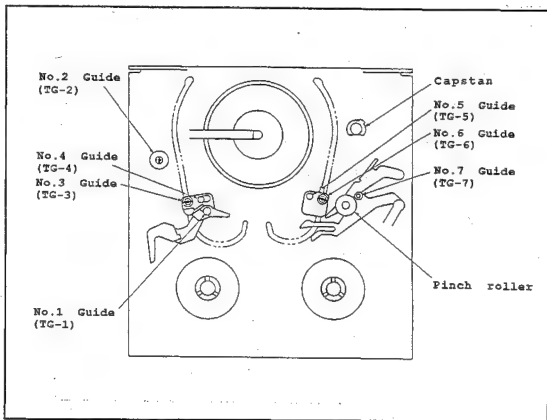


Fig.II-5

2-4 Periodic Check/Confirmation Items

When performing periodical Check/Confirmation, refer to the following items.

Check/Conformation items		Hours of Use (H)										Remarks
		500	1000	1500	2000	2500	3000	3500	4000	4500	5000	
Drum/ Tape Path	Cleaning of tape path surface	○	○	○	○	○	○	○	○	○	○	Be careful for oil
	Cleaning of rotary drum assembly	○	○	○	○	○	○	○	○	○	○	Be careful for oil
Driving Systems	Relay belt	—	☆	—	☆	—	☆	—	☆	—	☆	
	Capstan shaft	—	⊗	—	⊗	—	⊗	—	⊗	—	⊗	Be absolutely careful not to put oil on the tape path surface.
	Relay pully shaft	—	⊗	—	⊗	—	⊗	—	⊗	—	⊗	
	Loading motor	—	☆	—	☆	—	☆	—	☆	—	☆	
Confirmation	Abnormal noise	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	
	Back tension measurement	—	☆	—	☆	—	☆	—	☆	—	☆	
	Brake system	—	☆	—	☆	—	☆	—	☆	—	☆	
	FWD.RVS torque measurement	—	☆	—	☆	—	☆	—	☆	—	☆	

Oil and Grease

- (1) "One drop of oil" means the amount which sticks to a 2mm diameter rod, as shown in Fig.II-6.
- (2) Use oil and grease specified below.
Molyton grease DY9-3009-000
Hydroflud-NT68 Commercially available (DY9-3010-000).
- (3) For a shaft receiver, be sure to use the oil without dust particles, etc. If the oil with such substances used, a shaft receiver may be damaged by friction, etc..

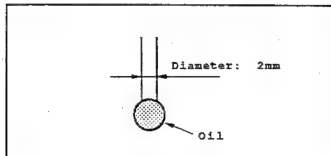


Fig.II-6

3 Disassembling/Adjustment for Mechanical Section

3-1 Roller Assembly

- Disassembling (Fig.II-7)

- (1) To dismount the roller assembly ②, removes a screw ①.

- Reassembling (Fig.II-7)

- (1) Install the roller assembly while aligning the two dowels with the two holes ④ at mechanical chassis.
- (2) Secure the roller assembly ② with a screw ①.

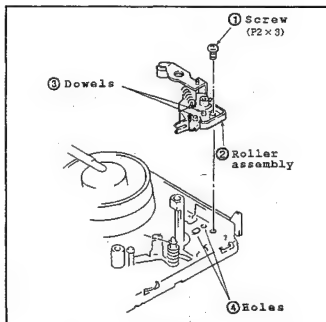


Fig.II-7

3-2 Guide Guard

- Disassembling (Fig.II-8)

- (1) To detach the guide guard, remove a screw ①.

- Reassembling (Fig.II-8)

- (1) Install the guide guard while aligning the dowel ③ with the hole ④.
- (2) Secure the guide guard ② with a screw ①.

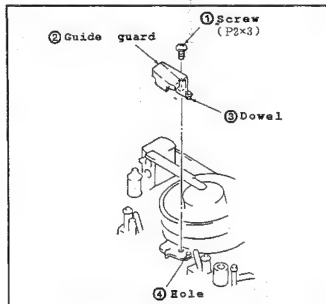


Fig.II-8

3-3 Capstan Motor

• Disassembling (Fig.II-9)

- (1) Set the unloading state.
- (2) Rotate the stopper ① in direction A until it comes to an end.
- (3) To take out the capstan motor ③, remove the two set screws ②.

• Reassembling (Fig.II-9)

- (1) Align the two dowels ④ with the two holes ⑤ to match the gear section ⑥ with the connecting gear ⑦.
- (2) Secure the capstan motor ③ with the two set screws ②.
- (3) Rotate the stopper ① in direction of B until it comes to an end.

- *Notes:
1. Do not match the gear section ⑥ and the connecting gear ⑦ forcibly to prevent the cam grooves damaging.
 2. Fit the capstan motor ③ and the chassis without space.
 3. Do not touch the capstan motor shaft, the rotor section and the oil seals.

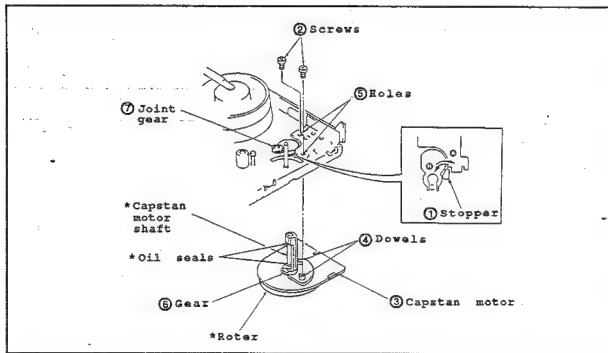


Fig.II-9

3-5 LB Brake, LB Lever

• Disassembling (Fig.II-10)

- (1) To take off the TL plate ②, remove the screw ①.
- (2) To take off the LB brake ④, remove the shaft pin ③.
- (3) To take off the LB lever ⑥, remove the shaft pin ⑤.

*Note: If the claw part of shaft pin ③ and ⑤ damaged, replace them.

• Reassembling (Fig.II-11)

- (1) Assemble the LB lever ⑥ while inserting the LB gear pin ⑦ to the hole of LB lever ⑥. Then, secure it with the shaft pin ⑤.
- (2) Assemble the LB brake ④ while inserting the pin ⑧ to the notch ⑨ of LB lever ⑥ and the gear ⑩ to the notch ⑪.
- (3) Install the shaft pin ③.
- (4) Assemble TL plate ② while aligning the dowel ⑫ and the hole ⑬. Then, secure it with the screw ①.

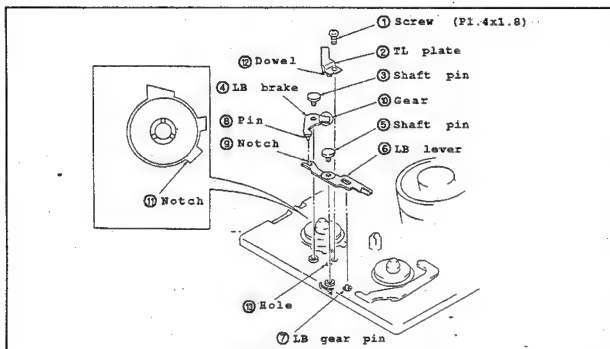


Fig.II-11

3-6 LB Releasing Arm

• Disassembling (Fig.II-12)

- (1) Take off the LB releasing arm ② while pushing the claw ① in the arrow direction.

• Reassembling (Fig.II-12)

- (1) Install the LB releasing arm ② to the shaft ③ while inserting a, b, c and d to the holes ④, respectively. Then, secure it by hooking the claw ①.

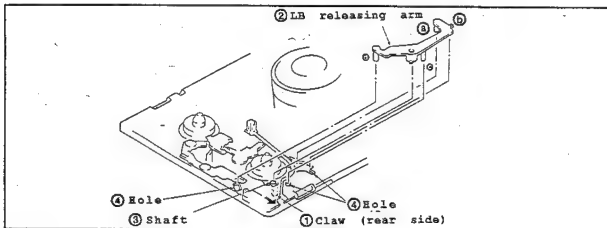


Fig.II-12

3-7 RK Stopper, RK Stopper Arm

• Disassembling (Fig.II-13)

- (1) Remove the screw ①.
- (2) To take off the RK stopper arm ③, unhook the claw ② of chassis.
- (3) Take off the RK stopper ④.

• Reassembling (Fig.II-13)

- (1) Assemble the RK stopper ④ onto the shaft ⑤.
- (2) Assemble RK stopper arm ③ onto the shaft ⑤ while inserting the pin ⑩ to the hole ⑪. Then, secure it by hooking the claw ② to the hole ⑦.
- (3) Install the spring ① to the shaft ⑤. Then, hook it to the claws ⑧ and ⑨, respectively.

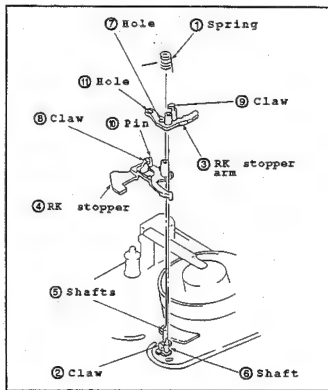


Fig.II-13

3-8 Pinch Arm, TG-7 Arm

• Disassembling (Fig.II-14)

- (1) Set the unloading state.
- (2) To take off the pinch arm ②, remove the washer ①.
- (3) To detach the TG-7 plate spring ⑤, bend the claw ④ of hole ③ by using a thin screwdriver or equivalent.
- (4) Detach the TG-7 arm.

• Reassembling (Fig.II-14)

- (1) Apply the grease on the inside and the bottom surface of the hole ⑦.
- (2) Insert the shaft ⑧ of TG-7 arm ⑥ to the hole ⑦.
- (3) Apply the grease on the shadowed area ⑧. (Fig.A)
- (4) Insert the TG-7 plate spring ⑤ to the hole ③.
Then, secure it by hooking the claw ④.
- (5) Apply the 1/2 drop of oil to the shaft ⑧. (Fig.B)
- (6) Insert the pinch arm ② to the shaft ⑧.
Then, assemble while inserting the pinch sub-arm's cut-up part into the ⑥ part.
- (7) Secure it with the washer ①.

- * Notes: 1. Do not apply the grease on the screw ⑩ of TG-7 arm ⑥. (Fig.A)
 2. Be careful for the TG-7 guide and the rubber part when inserting.
 3. After reassembled, be sure to perform the tape path adjustment.

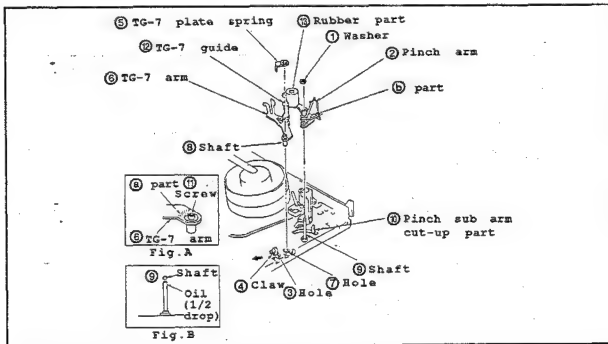


Fig.II-14

• Disassembling (Fig.II-15)

- (1) Take out the TG-2 upper flange ①.
- (2) Take out the TG-2 roller ②, TG-2 sleeve ③, TG-2 lower flange ④ and the coil spring ⑤.

• Reassembling (Fig.II-15)

- (1) Install the coil spring ⑤, TG-2 lower flange ④, TG-2 sleeve ③ and TG-2 roller ② to the shaft.
- (2) Secure the TG-2 upper flange ① to the shaft by turning it four to 6 times.

• Presetting (Fig.II-16)

- (1) Turn the TG-2 upper flange ① to adjust the height between the mechanical chassis surface and the TG-2 upper flange to 18.6mm.

*Note: After presetting, perform the tape path adjustment.

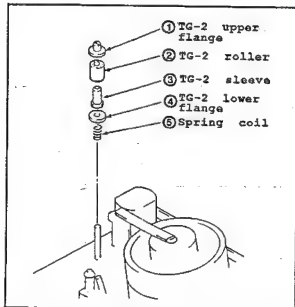


Fig.II-15

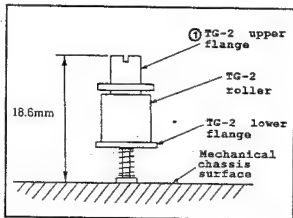


Fig.II-16

3-10 S Reel Table, T Reel Table

• Disassembling (Fig.II-17)

- (1) In the same procedures in "3-4", dismount the S and T brake.
- (2) In the same procedures in "3-5", detach the TL plate.
- (3) In the same procedures in "3-11", take off the tension regulator band.
- (4) Dismount the S reel table ①.
- (5) Turn the stopper ② in the direction of ④ by 90° approximately.
- (6) While shifting the LB releasing arm ③ in the direction of ⑤, dismount the T reel table.

• Reassembling (Fig.II-17)

*Caution: When mounting S and T reel tables, be careful not to drop the oil onto the reflection plate at the rear side. If the oil dropped, dust particles may put on and it makes the counter inaccurate.

- (1) Apply the 1/2 drop of oil to the shaft ⑤. (Fig.A)
- (2) Rotate RK gear ⑥ to the direction of ④.
Rotate the TS brake ⑦ to the direction of ⑩.
- (3) While shifting the LB releasing arm ③ to the direction of ⑤, mount the T reel table ④ to the shaft ⑤.
Then, turn the stopper ② to the direction of ⑥ until it comes to an end.
- (4) Apply the 1/2 drop of oil to the shaft ⑧. (Fig.B)
- (5) Rotate the RK gear ⑥ to the direction of ④.
Rotate the UL brake ⑨ to the direction of ③.
Rotate the LB brake ⑪ to the direction of ④.
- (6) Mount the S reel table to the shaft ⑧.
- (7) In the same procedures in "3-11", hook up the tension regulator band.
- (8) In the same procedures in "3-5", attach the TL plate.
- (9) In the same procedures in "3-4", mount the S brake and T brake.

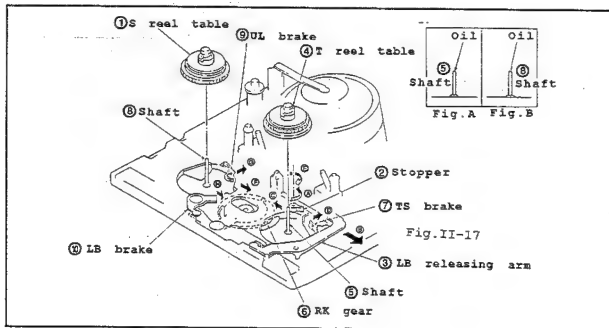


Fig.II-17

3-11 Tension Regulator Band/Arm

• Disassembling (Fig.II-18)

- (1) In the same procedures in "3-5", detach the TL plate.
- (2) Remove the screw ①.
- (3) Take off the tension regulator band from the shaft ③ of tension regulator arm ② by using a thin screwdriver or equivalent.
- (4) Remove the spring coil ⑤.
- (5) Remove the washer ⑥ from the rear side of mechanical chassis.
Then, detach the tension regulator arm ②.
- (6) To detach the adjust arm ⑧, unhook the claw ⑦.

*Note: When detaching the tension regulator band ④, be careful not to twist or fold it. Also, when detaching it, do not touch the felt side ⑨ and drop the oil.

• Reassembling (Fig.II-18)

- (1) Mesh the adjust arm ⑧ with the position indicated in the Fig. A, then, hook the claw ⑦.
- (2) Apply the 1/2 drop of oil to the hole ⑩.
- (3) Attach the tension regulator arm ② to the slot ⑪ while inserting ③ part inside of switch lever assembly. (A indicated by an arrow.) (Fig.B)
- (4) While pressing the tension regulator arm ② from the front side of chassis, secure it with a washer ⑥ from the rear side.
- (5) Hook the spring coil ⑤ to the adjust arm ⑧ and the tension regulator arm ②, respectively. The direction of coil is as indicated in the Fig.
- (6) Attach the tension regulator band ④ to the shaft ③ of the tension regulator arm ② while fitting the felt side ⑨ onto the shadow area of S reel table ⑫.
- (7) Assemble the tension regulator plate ⑬ of the tension regulator band ④ while aligning it with the dowel ⑭ of chassis. Then, secure it with the screw ①.
- (8) In the same procedures in "3-5", attach the TL plate.
- (9) In the same procedures in "3-21", perform the tension regulator adjustment.
- (10) In the same procedures in "3-22", perform the back tension adjustment.

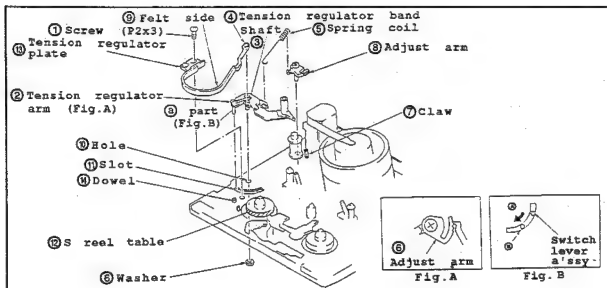


Fig.II-18

3-12 Drum Unit, Dew Sensor

• Disassembling (Fig.II-19)

- (1) Set unloading state.
- (2) Unplug the flexible connector ① and the connectors ②.
- (3) In the same procedures in "3-2", detach the guide guard.
- (4) To detach the earth terminal ④, remove the screw ③.
- (5) To dismount the drum ⑥ from the chassis, remove the three setscrews ⑤.
- (6) Disconnect the connector ⑩.
- (7) To detach the dew sensor ⑧, remove the screw ⑦.

• Reassembling (Fig.II-19)

- (1) Mesh the ⑨ part of dew sensor ⑧ with the notch ⑪. Then, secure them with the screw ⑦.
 - (2) Attach the connector ⑩.
 - (3) Put the harness ⑤ of dew sensor ⑧ under the claw ⑫. (Fig.A)
 - (4) Insert the connectors ② and the flexible connector ① into the chassis' hole ⑬.
- Then, mount the drum while aligning the dowels ⑭, and secure it with the screws ⑤.
- (5) While aligning the earth terminal ④ with the chassis' two dowels ⑭, secure it with the screw ③.
 - (6) In the same procedures in "3-2", attach the guide guard.
 - (7) Attach two connectors ② and the flexible connector ① to the C.B.A..

*Notes: 1. Be careful not to flaw the head chip ⑨ and the tape path surface of drum ⑥.

2. After reassembling, perform the tape path adjustment.

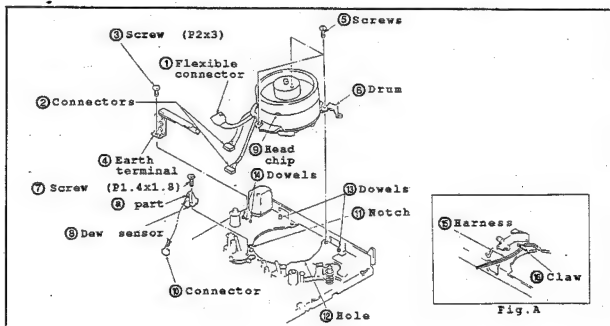


Fig. II-19

3-13 Eject Lever, Switch Lever, Pinch Sub Arm

• Disassembling (Fig.II-20)

- (1) Set unloading state.
- (2) In the same procedures in "3-3", dismount the capstan motor.
- (3) To dismount the eject lever ②, unhook the claw ①.
- (4) To detach the switch lever ④, remove the washer ③.
- (5) Remove the spring ⑤.
- (6) To detach the pinch sub arm ⑦, remove the washer ⑥.

• Reassembling (Fig.II-20)

- (1) Apply the grease onto the shaft ⑧. (Fig.A)
- (2) Assemble the pinch sub arm ⑦ while inserting the ③ part into the slot ⑨.
- (3) Secure it with the washer ⑥.
- (4) Hook the ⑥ part of spring ⑤ between the claw ⑫ and the chassis side while hooking ⑥ part to the claw ⑫.
- (5) Apply 1/2 drop of oil to the shaft ⑩. (Fig.B)
- (6) Assemble the switch lever ④ to the shaft ⑩ while aligning the groove ⑪ with the projection ⑤ of mode switch. At this time, insert the pin ⑬ to the outside groove ⑭ of drive gear (left) ⑦.
- (7) Secure it with a washer ③.
- (8) Attach the eject lever ② and hook the claw ①.
- (9) In the same procedures in "3-3", mount the capstan motor.

*Note: When installing the switch lever ④ to the shaft ⑩, set the pin ⑬ of tension regulator arm to the inside of switch lever ④. (within the extent of ① indicated by an arrow.)

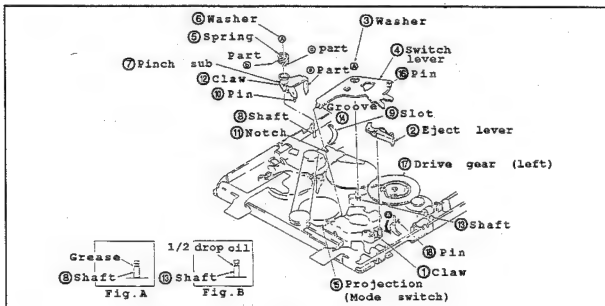


Fig.II-20

3-14 Timing Belt (L), RC Gear, Loading Lever, Timing Belt(S), Joint Gear

• Disassembling (Fig.II-21)

- (1) Set unloading state
- (2) In the same procedures in "3-3", dismount the capstan motor.
- (3) In the same procedures in "3-13", detach the pinch sub arm.
- (4) Remove the washer ①. Then dismount the RC gear ② (with the timing belt (L) ③ hooked) from the shaft ④.
- (5) Remove the washer ⑤. Then, detach the loading lever ⑥ while pushing the claw ⑦ toward the direction ⑧.
- (6) Turn the stopper ⑨ toward the direction ⑩ by 90°.
- (7) Detach the joint gear ⑪ (with the timing belt (S) ⑫ hooked) from the shaft ⑬.
- (8) Separate the timing belt (S) ⑫ from the relay pulley ⑭.

*Note: When dismounting the gear ⑪, do not touch the flange ⑬ part. (Fig.D)

• Reassembling (Fig.II-21)

- (1) Apply 1/2 drop of oil to the shaft ⑬. (Fig.F)
- (2) Hook the timing belt (S) ⑫ to the joint gear ⑪, and then to the gear ⑭ of relay pulley ⑭ (Fig.E).
- (3) Attach the joint gear ⑪ to the shaft ⑬ with the timing belt (S) ⑫ attached.
- (4) Turn the stopper ⑨ toward the ⑩ direction until it comes to an end.
- (5) Apply 1/2 drop of oil to the shaft ②. (Fig.A)
- (6) Insert the loading lever ⑥ into the shaft ②. Then, match the ③ part with the claw ⑦ and insert the pin ⑧ into the groove of drive gear (right) ④.
- (7) Secure the washer ⑤.
- (8) Hook the timing belt (L) ③ to the gear as indicated in the Fig.B, and to the gear ⑭ of the relay pulley ⑭. (Fig.E)
- (9) Mount the RC gear ② to the shaft ④ (with the timing belt (L) ③ attached). Then, mesh it with the RK gear ⑤.
- (10) Secure the washer ①.
- (11) Apply the grease to the position of loading lever ⑥ as indicated in Fig.C.
- (12) In the same procedures "3-14" and "3-3", assemble the pinch sub arm and the capstan motor.

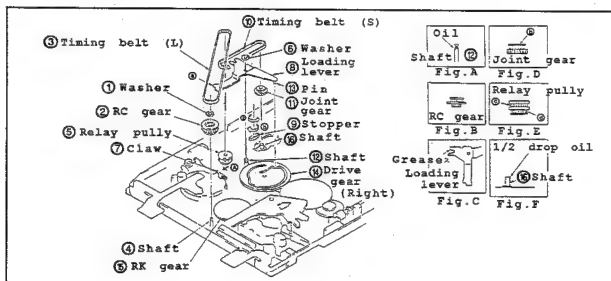


Fig.II-21

3-15 Relay Pully, TS Brake, LB Gear, RK Gear

• Disassembling (Fig.II-22)

- (1) Set unloading state.
- (2) In the same procedures in "3-3", dismount the capstan motor.
- (3) In the same procedures in "3-13", detach the switch lever.
- (4) In the same procedures in "3-14", detach the timing belt (L), the RC gear, the loading lever, the timing belt (S) and the joint gear.
- (5) To take off the relay pully ②, remove the washer ①.
- (6) To detach the TS brake ④, unhook the claw ③.
- (7) Remove the spring ⑤.
- (8) To detach the LB gear ⑦, remove the washer ⑥.
- (9) Detach the RK gear ⑧.

*Note: When taking off the relay pully ②, do not touch the flange part ⑩.
(Fig.C)

• Reassembling (Fig.II-22)

- (1) Apply the 1/2 drop of oil to the shaft ⑨. (Fig.A)
- (2) Install the RK gear ⑧ to the shaft ⑨ longitudinally.
- (3) Apply the 1/2 drop of oil to the shaft ⑩. (Fig.B)
- (4) Install the LB gear ⑦ to the shaft ⑩. Then secure it with the washer ⑥.
- (5) Put the spring into the shaft ⑪. Then, hook it to the notch ⑫, and cut-up part ⑬.
- (6) Assemble the TS brake ④, and hook the claw ③.
- (7) Apply the 1/2 drop of oil to the shaft ⑭. (Fig.D)
- (8) Attach the relay pully ② to the shaft ⑭, and secure it with the washer ①.
- (9) In the same procedures in "3-14", attach the timing belt (L), the RC gear, the loading lever, the timing belt (S) and the joint gear.
- (10) In the same procedures in "3-13" and "3-3", install the switch lever and the capstan motor.

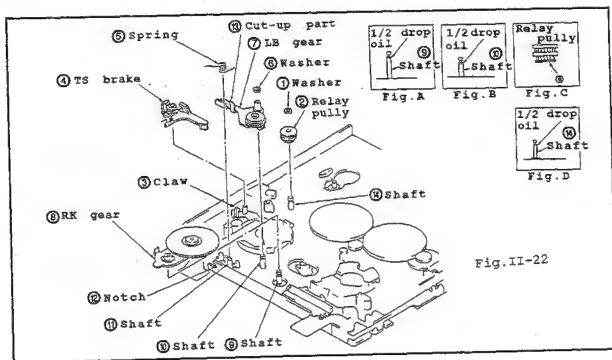


Fig.II-22

3-16 UL Gear, UL Brake, UL Arm, LB Plate spring

• Disassembling (Fig.II-23)

- (1) In the same procedure in "3-13", detach the switch lever.
- (2) To take off the UL gear ②, remove the washer ①.
- (3) Detach the UL arm ③, the washer ④ and the LB plate spring ⑤.
- (4) Take off the UL brake ⑥.

• Reassembling (Fig.II-23)

- (1) Install the UL brake ⑥.
- (2) Apply the 1/2 drop of oil to the shaft ⑦. (Fig. A)
- (3) As shown in the Fig.B, attach the LB plate spring ⑤ to the shaft ⑦. Then, attach the washer ④.
- (4) While matching the projection ⑧ with the groove ⑨ of UL brake ⑥, install UL arm ③ to the shaft ⑦.
- (5) Attach the UL gear ② to the shaft ⑦. Then, mesh it with drive gear (left) ⑩.
- (6) Secure it with the washer ①.
- (7) In the same procedures in "3-13", install the switch lever.

*Note: To prevent the LB plate spring ⑤ damaging, do not secure the washer ① forcibly.

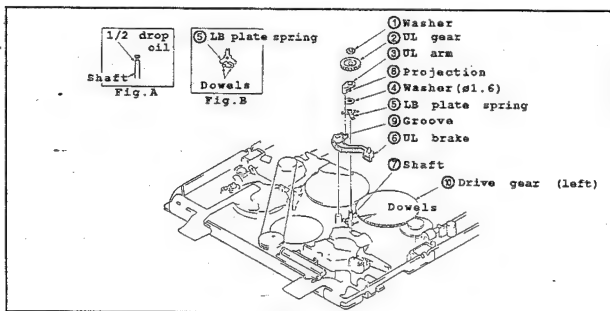


Fig.II-23

3-17 Coaster (Right), Drive Gear (Right)

• Disassembling (Fig.II-24)

- (1) In the same procedures "3-3" and "3-12", dismount the capstan motor and the drum unit.
- (2) In the same procedures in "3-14", take off the loading lever.
- (3) Set STOP mode.
- (4) To take off the coaster plate spring ② and the coaster (Right) ③, remove the screw ①.
- (5) To detach the plate TT ⑤, remove the two screws ④.
- (6) To dismount the drive gear (Right) ⑦, remove the washer ⑥ (ø1.5).

• Reassembling (Fig.II-24)

*Caution: Do not turn the tilt adjusting screw ③ of coaster (Right). (Repair parts have been already adjusted.)

- (1) Apply the grease to the indicated positions of chassis as shown in Fig.A.
- (2) Apply the 1/2 drop of oil to the shaft ⑩. (Fig.F)
- (3) Apply the grease onto the pin ⑨, the shaft ⑩ and the dowel ⑪ of coaster (Right) ③.
- (4) Assemble the pin ⑨ and the shaft ⑩ aligning the slot ⑪ of chassis.
- (5) Put the brake releasing arm ⑦ to the arrowed direction A.
- (6) Install the drive gear (Right) ⑦ to the shaft ⑩. Then, mesh it with the drive gear (Left) ⑧ while aligning each phases as shown in Fig.B.
- (7) Align a with b, the hole ⑥ with the pin ⑨ of coaster (Right) ③, respectively.
- (8) Secure the washer ⑥ (ø1.5).
- (9) Assemble the coaster plate spring ② while aligning the shaft ⑩ (coaster ③) with the pin ⑨. Then, secure it with the screw ①. (Torque: 500g/cm approx).
- (10) Assemble the plate TT ⑤ aligning with the dowel ⑪. Then, secure it with the two screws ④ in numerical order.
- (11) Apply the grease to the positions indicated in the Fig.C and E.
- (12) In the same procedures in "3-14", install the loading lever.
- (13) In the same procedures in "3-12" and "3-3", mount the drum unit and the capstan motor.

*Note: After reassembling, perform the tape path adjustment.

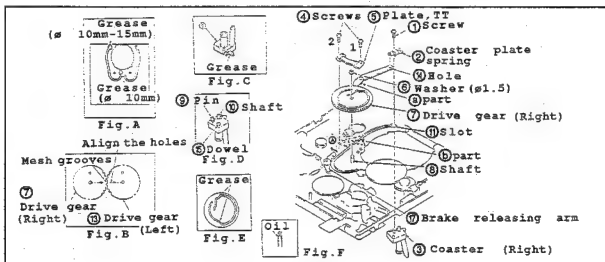


Fig.II-24

• Disassembling (Fig.II-25)

- (1) In the same procedures in "3-3" and "3-12", dismount the capstan motor and the drum unit.
- (2) In the same procedures in "3-13" and "3-14", detach the switch lever, and the loading lever.
- (3) In the same procedures in "3-17", detach the coaster (Right) and the drive gear (Right).
- (4) To take off the coaster plate spring ② and the coaster (left) ③, remove the screw ①.
- (5) To detach the plate SS ⑤, remove the two set screws ④.
- (6) To take off the drive gear (Left) ⑦, remove the washer ⑥ (ø1.5).

• Reassembling (Fig.II-25)

- (1) Apply the grease onto the indicated positions of chassis in the Fig.A.
- (2) Apply the 1/2 drop of oil onto the shaft ⑩. (Fig.E)
- (3) Apply the grease onto the pin ⑨, the shaft ⑩ and the dowel ⑤ of coaster (Left) ③. (Fig.B)
- (4) Assemble the pin ⑨ and the shaft ⑩ aligning the slot ⑪.
- (5) Insert the driver gear (Left) ⑦ into the shaft ⑩ while meshing with the wheel gear ⑫ and the UL gear ⑧.
- (6) Align ④ part with the slot ⑪, and the hole ④ with the pin ⑨ of coaster (Left) ③.
- (7) Secure it with the washer ⑥ (ø1.5).
- (8) Install the coaster plate spring ② while aligning the shaft ⑩ and the pin ⑨ of coaster (Left) ③. Then, secure it with the screw ①. (Torque: 500g/cm, approx)
- (9) Attach the plate SS ⑤ while aligning with the dowel ⑤. Then, secure it the two screws ④ in numerical order.
- (10) Apply the grease onto the positions indicated in the Fig.C and D.
- (11) In the same procedures in "3-17", install the coaster (Right) and the drive gear (Right).
- (12) In the same procedures in "3-14" and "3-13" install the loading lever and the switch lever.
- (13) In the same procedures in "3-12" and "3-3", install the drum unit and the capstan motor.

*Note: After reassembling, perform the tape path adjustment.

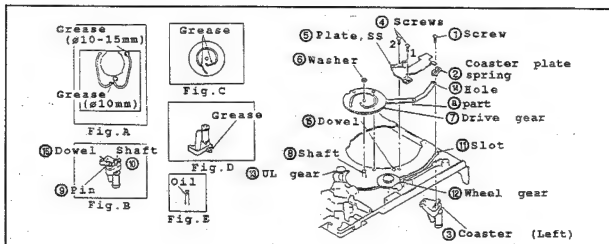


Fig.II-25

3-19 Loading Motor, Worm Assembly, Wheel Gear, Brake Releasing Arm

• Disassembling (Fig.II-26)

- (1) In the same procedures in "3-3" and "3-13", dismount the capstan motor and the switch lever.
- (2) In the same procedures in "3-14", detach the loading lever.
- (3) In the same procedures in "3-17" and "3-18", detach the drive gears (Right) and (Left).
- (4) To dismount the loading motor (2), remove the two screws (1).
- (5) Take off the brake releasing arm (3).
- (6) To take off the wheel gear (5), remove the washer (4).
- (7) Unhook the six claws (7) of worm a'ssy..

• Reassembling (Fig.II-26)

- (1) Install the worm a'ssy (6) while hooking the six claws (7).
- (2) Apply the grease to the five shadow areas of worm a'ssy indicated in the Fig.A.
- (3) Apply the 1/2 drop of oil to the shaft (8). (Fig.B)
- (4) Insert the wheel gear (5) into the shaft (8), and mesh it with the worm a'ssy's gear.
- (5) Assemble the brake releasing arm (3).
- (6) Apply the grease onto the entire surface of loading motor gear part.
- (7) Align the loading motor (2) with the chassis. Then, secure them with the two screws (1).
- (8) In the same procedures in "3-18" and "3-17", install the drive gears (Left) and (Right).
- (9) In the same procedures in "3-14", install the loading lever.
- (10) In the same procedures in "3-13" and "3-3", install the switch lever and the capstan motor.

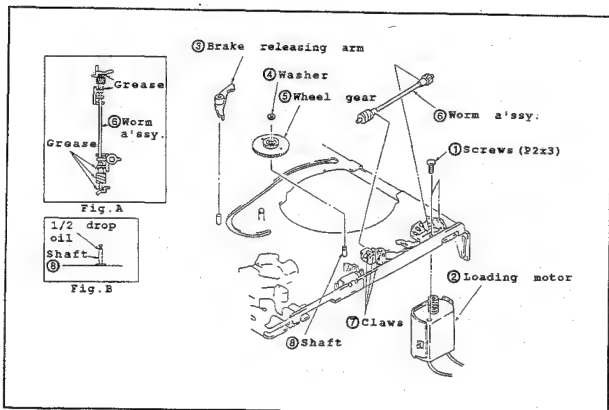


Fig.II-26

3-20 Rotary Upper Drum

• Disassembling

Note: If recordable, perform re-cording before disassembling.

- (1) Unsolder three solderings ⑧. Then, confirm that the terminals which come out from the hole of C.B.A. can be moved freely. (Fig.II-27)
- (2) Remove the two setscrews ①.
- (3) Secure the jig ④ to the drum with the two setscrews ②. (Setscrews supplied with jig ④ as a set.) Then, screw in the hexagonal bolt ③ into the hole of jig ④ to dismount the rotary upper drum ⑤. (Fig.II-28)

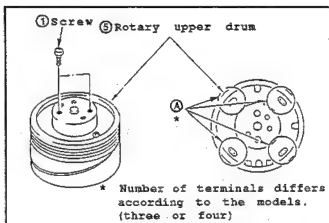


Fig.II-27

• Reassembling

- (1) Clean the flange surface and the rotary upper drum ⑤ surface which faced the flange surface. Check that there is no dust particles and flaws.
- (2) Insert the jig ⑦ into the drum positioning holes of upper/lower rotary drum. (Fig.II-29)

*Note: At this time confirm that the terminals ③ come out from the holes of the rotary upper drum C.B.A..

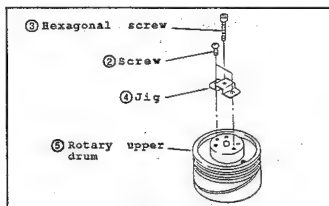


Fig.II-28

- (3) Pull out the jig ⑦, and then push the rotary upper drum ⑤ into the lower one manually and gently. If it cannot be set completely to the bottom, Tighten the two setscrews ① alternately and temporarily. (Fig.II-27)
- (4) Insert the jig ⑦ into the positioning holes ⑥ again. If it cannot be inserted smoothly, loosen the two setscrews ①. Then perform the step (3) of disassembling procedure.
- (5) Tighten the two setscrews ① thoroughly.
- (6) Solder the terminals ③. (Fig.II-27)

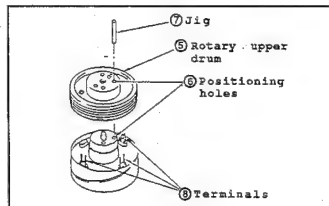


Fig.II-29

*Notes: 1. When soldering, be careful not to let the solder flow to the C.B.A..

2. After reassembling, perform the tape path adjustment.

3-21 Tension Regulator Position Adjustment (Fig.II-30)

- (1) Set the cassette tape, and set it to PLAY mode.
- (2) Check that the distance between ② part of tension regulating arm ① and the groove ② of chassis is within $1.1 \pm 0.3\text{mm}$. If it is not the specified distance, perform the following adjustment (from step (3)) without the cassette tape.
- (3) Loosen the screw ④ of tension regulating plate ⑤.
- (4) If the distance measured in step (2) is more than specified, slide the plate ⑤ in the direction of arrow ④. If it is less than the specified distance it in the direction of arrow ⑤. After sliding, secure it with the screw ④.
- (5) For checking, perform the steps (1) and (2).

*Notes: 1. Use the cassette tape which is forwarded to about the middle section.

2. The trail of left coaster on the groove ② of chassis:
1.1mm(approx.)

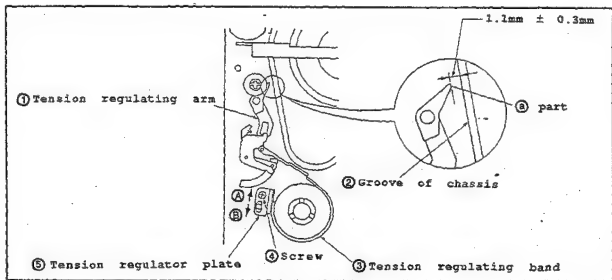


Fig.II-30

3-22 Back Tension Adjustment (Fig.II-31)

- (1) Set the cassette torque gauge (DY9-1047-000)
- (2) Set PLAY mode.
Confirm that the torque at S reel table is 9-13 g/cm.
- (3) If not, adjust the adjust arm ①.

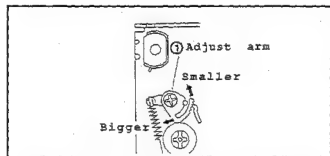


Fig.II-31

3-23 T Reel Table Torque Check

- (1) Set the cassette torque gauge (DY9-1047-000)
- (2) Set PLAY mode.
Confirm that the torque at T reel table is 7-15 g/cm.
- (3) Set REV mode.
Confirm that the torque at T reel table is 13-25 g/cm.

4. Tape Path Adjustment

(Notes for No.7 Guide only)

As the height adjusting screw for No.7 guide is located apart from the No.7 guide. So, to adjust the No.7 guide while watching the state of tape, modify the cassette tape as shown in the Fig.II-32.

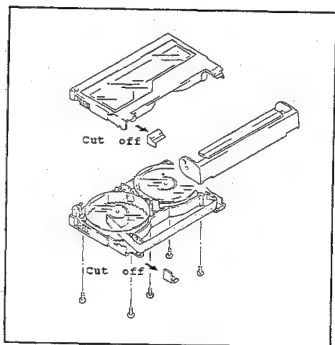


Fig.II-32

4-1 Preparation for Adjustment

*Caution: 1. Do not turn the tilt adjusting screw of the coaster (Right). Replace it if any adjustments required. The repair parts have been already adjusted.

- (1) Clean the tape running surface.
- (2) Referring to the service manuals for each system, observe the RF envelope signal and RF switching pulse on oscilloscope.
- (3) Playback the Alignment tape for tracking.
- (4) Confirm that the waveform at inlet and outlet sides are flat.
If not, perform the following adjustments from page 46.

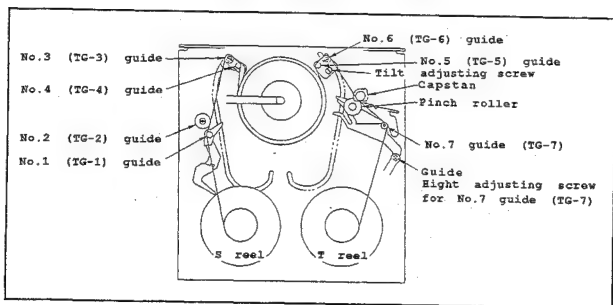


Fig.II-33

4-2 Tracking Adjustment (Fig.II-34)

- (1) Playback Alignment tape for tracking adjustment.
- (2) Loosen the screw ② a little by inserting a hexagonal wrench (0.89mm) or equivalent into the hole ①. Then, turn the No.3 guide ③ to make the waveform at inlet side flat.
- (3) Loosen the screw ⑤ a little by inserting a hexagonal wrench (0.89mm) or equivalent into the hole ④. Then, turn the No.6 guide ⑥ to make the waveform at outlet side flat.

*Note: Be careful not to loosen the screws too much because the guide will be easily moved.

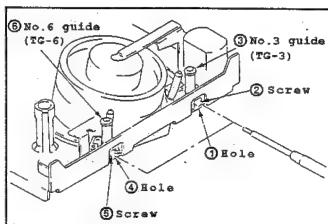


Fig.II-34

4-3 Tracking Fine Adjustment (Fig.II-35)

- (1) Referring to the service manuals for each system, set it to the track shift made. (70 %)
- (2) Confirm that the waveform is flat. If not, turn No.3 and 6 guides to make it flat.
- (3) Tighten the screw ② of No.3 guide to lock it. At this time, confirm that the inlet side of waveform is not changed. (Fig.II-34)
- (4) Tighten the screw ⑤ of No.6 guide to lock it. At this time, confirm that the outlet side of waveform is not changed. (Fig.II-34)

*Note: Torque at Screws ②, ⑤: 200g/cm approx.

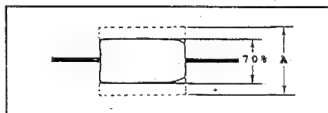


Fig.II-35

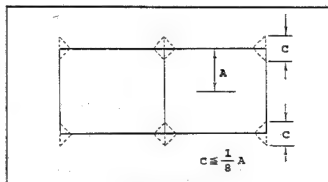


Fig.II-36

4-4 No.2 Guide Adjustment

*Note: When turning or replacing the No.2 guide, perform the following preset procedures before adjustment.

4-4-1 No.2 Guide Presetting

- To preset, adjust the distance between the surfaces of mechanical chassis and TG2 upper flange ① to 18.6 mm by turning TG2 upper flange ①.

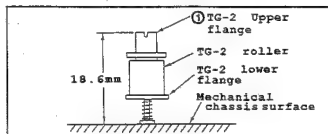


Fig.II-37

4-4-2 No.2 Guide Adjustment (Fig.II-38, 39)

- (1) Playback the tape having 10 μ m in thickness (P6-120 etc.). Then, set it to REV mode.
- (2) Confirm that the tape is not creased at the lower flange ② of No.2 guide ①. If creased, turn the upper flange ③ of No.2 guide ① clockwise until the crease removed.
- (3) Playback the Alignment tape for tracking adjustment.
- (4) In the same procedures in "4-2" and "4-3", perform the tracking and tracking fine adjustments.
- (5) At track shift mode, playback the tape after CUE/REV mode. Confirm that the RF envelope rises horizontally within 2 sec as shown in Fig.II-40.
- (6) If not, turn the upper flange ③ of No.2 guide ① counter clockwise by 90°. Then, perform the step (5) again.

Repeat the steps (5), and (6) until the normal waveform as specified is obtained. When the RF envelope changed at this time, perform the tracking fine adjustment for inlet side. Then, perform the step (5).

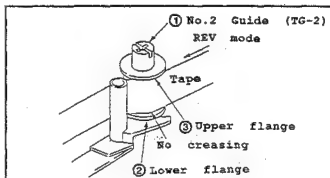


Fig.II-38

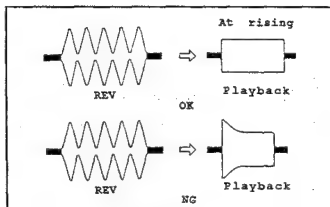


Fig.II-39

4-5 No.7 Guide Adjustment (Fig.II-40)

- (1) Playback the tape having 10 μ m in thickness (P6-120, etc.). Then, set it to REV mode.
- (2) Confirm that the tape between the No.6 guide ① and the capstan ② is not loosened. If loosened, turn the height adjusting screw ④ of No.7 guide ③ to remove it.
- (3) Set it to PLAY mode. Then, confirm that the tape between the capstan ② and the No.7 guide ③ is not loosened (0.5mm or less).

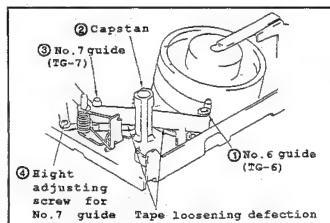


Fig.II-40

If not (more than 0.5mm), turn the height adjusting screw ④ of No.7 guide ③ until the rating is obtained.

- (4) Set it to REV mode again. Confirm that the tape loosening between the No.6 guide ① and the capstan ② is 0.3mm or less.

4-6 Checks after Adjustments

*Note: If the following ratings cannot be obtained, perform the tracking, tracking fine, No.2 guide and No.7 guide adjustments, respectively.

4-6-1 Tracking Check (Fig.II-41)

- (1) Set it to the track shift mode. Confirm that the amplitude of RF envelope is 70% approx.
- (2) Confirm that the minimum amplitude (E MIN) is 65% or more of the maximum (E MAX).
- (3) Confirm that the waveform has no variations.

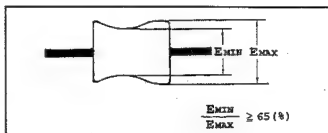


Fig.II-41

4-6-2 CUE/REV Waveform Check (Fig.II-42)

- (1) Playback the alignment tape for tracking adjustment. Then, set it to REV mode. Confirm that the tops between each waveform remains stable and equal within 5 sec.
- (2) Set it to CUE mode. Confirm that the tops between each waveform remains stable and equal for more than 5 sec.

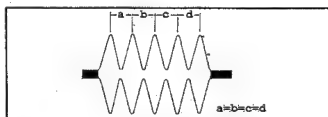


Fig.II-42

4-6-3 Rise Time Check

- (1) Playback the alignment tape for tracking adjustment.
- (2) After ejecting the tape once, playback it again.
- (3) Confirm that the RF envelope rises horizontally within 2 sec. Also, check that the tape is not loosened around the pinch roller.
- (4) After set it to CUE/REV and FF/REW, playback it again. Confirm that the RF envelope rises within 2 sec. horizontally. Also, check that the tape is not loosened around the pinch roller.
- (5) Repeat check procedures from (2) to (4) again.

4-6-4 Tape Movement Check (Fig.II-43)

- (1) Playback the cassette tape having 10μmm in thickness (P6-120 etc.). Confirm that the tape at each guide as indicated in the Fig.II-44 is not deflected or curled: (less than 3mm acceptable).
- (2) Set it from PLAY to CUE. Then, set it from PLAY to REV. Confirm that the tape at each guide is not also deflected or curled. (less than 0.3mm acceptable).

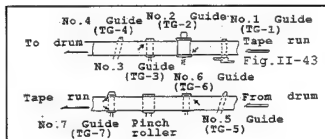


Fig.II-43

Canon

Canovision 8

SERVICE MANUAL

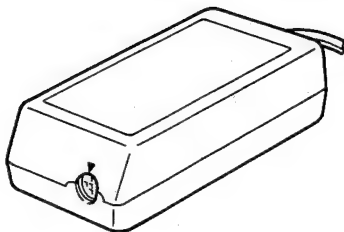
CA-E7E, B, AS

(REF. NO. D14-1130, 1133, 1134)

COMPACT POWER ADAPTOR

PAL

SECAM



DY8-1141-130-000

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Canon Inc.
Video Technical Service Dept.
First Edition: May, 1988
Printed in Japan

SAFETY PRECAUTIONS

The following precautions should be observed when servicing.

1. Since many parts in the unit have special safety-related characteristics, always use genuine CANON replacement parts.

Especially critical parts in the power circuit block should not be replaced with other makes.

Critical parts are marked with Δ in the schematic diagrams.

2. The primary source of X-ray radiation in this viewfinder is the picture tube. The tube used in the viewfinder is especially constructed to limit X-ray radiation emission. For continued X-ray radiation protection, the replacement tube must be same type as the original, CANON approved one.
3. When servicing, observe the original lead dress. If a short circuit is found, replace all parts which have been overheated or damaged by the short circuit.
4. After servicing, see to it that all the protective devices such as insulation barriers; insulation papers shields are properly installed.
5. After servicing, make the following leakage current checks to prevent the customer from being exposed to shock hazards.

5-1 Leakage Current Cold Check

- 1) Unplug the AC cord and connect a jumper between the two prongs on the plug.
- 2) Measure the resistance value, with an ohmmeter, between the jumpered AC plug and each exposed metallic cabinet part on the equipment such as screwheads, connectors, control shafts, etc. When the exposed metallic part has a return path to the chassis, the reading should be between $1M\Omega$ and $5.2M\Omega$. When the exposed metal does not have a return path to the chassis, the reading must be ∞ .

5-2 Leakage Current Hot Check

- 1) Plug the AC cord directly into the AC outlet. Do not use an isolation transformer for this check.
- 2) Connect a $1.5K\Omega$ 10 watt resistor, paralleled by $0.15\mu F$ capacitor, between each exposed metallic parts on the unit and a good earth ground such as a water pipe, as shown in figure 1.
- 3) Use an AC voltmeter, with 1000Ω volt or more sensitivity, to measure the potential across the resistor.
- 4) Check all exposed metallic parts of the cover (Cable connection, Handle bracket, metallic cabinet. Screwheads, Metallic overlays, etc), and measure the voltage at each point.
- 5) Reverse the AC plug in the AC outlet and repeat each of the above measurements.
- 6) The potential at any point should not exceed 0.75V RMS.

A leakage current tester (FLUKE MODEL: 8000A equivalent) may be used to make the hot checks.

Leakage current must not exceed 0.5 milliamp.

In case a measurement is out side of the limits specified, there is a possibility of a shock hazard, and corrective action must be taken before returning the instrument to the customer.

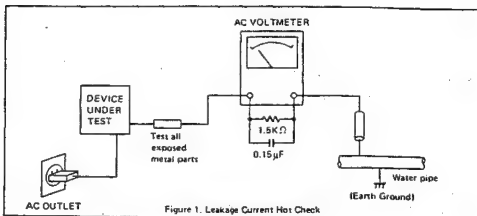


Figure 1. Leakage Current Hot Check

Chapter 1 Operations

1. Main Parts in Mechanical Section

1-1 Locations and Nomenclatures

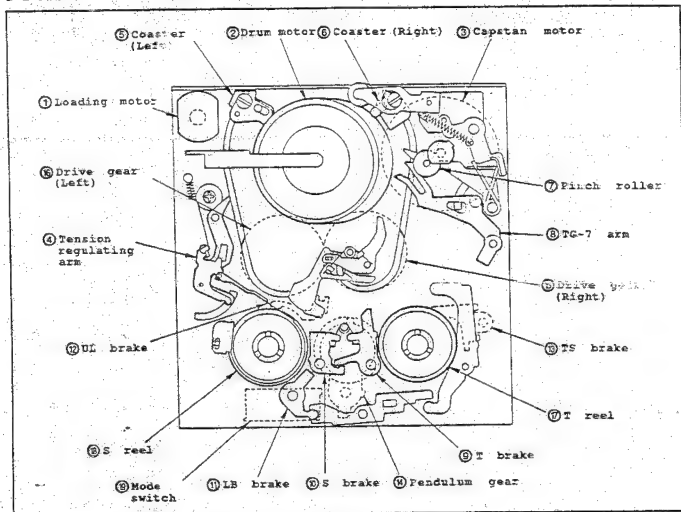


Fig. I-1

1-2 Relationships between Each Mode and Mode Switch

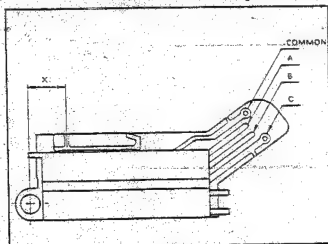


Fig. I-2

Modes	X (mm)	A	B	C
Eject	1.7-2.7	opened	opened	shorted
Blank	2.7-5.7	opened	opened	opened
Load/Unload	5.7-6.7	opened	shorted	shorted
Blank	6.7-8.1	opened	shorted	opened
Stop	8.1-9.1	shorted	shorted	opened
Blank	9.1-12.0	shorted	opened	opened
Play	12.0-13.3	shorted	opened	shorted

Table I-1

Note: "Opened" and "Shorted" in the table is versus the COMMON.

3. Disasse

- 3-1 Roll
- 3-2 Guide
- 3-3 Cap
- 3-4 S
- 3-5 LE
- 3-6 LB
- 3-7 RK
- 3-8 Pin
- 3-9 TG
- 3-10 S
- 3-11 T
- 3-12 D
- 3-13 E
- 3-14 T
- 3-15 R
- 3-16 U
- 3-17 C
- 3-18 C
- 3-19 L
- 3-20 R
- 3-21 T
- 3-22 B
- 3-23 T

4. Tape Path

- 4-1 Prepa
- 4-2 Track
- 4-3 Track
- 4-4 No. 2
- 4-5 No. 7
- 4-6 Check

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SAFETY PRECAUTIONS

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Chapter I General

CA-E7 is a compact and light weight AC power supply for VM-E70, and is developed also as a quick charger for battery pack BP-E77.

1. Features:

- 1) Applicable to world-wide commercial power source.
- 2) By separating power supply section and Charge Coupler CR-E7 (connection part), the unit weight of VM-E70 at recording can be reduced.
Charge Coupler CR-E7 can be used at battery charging.

2. Specifications:

- 1) Input voltage: 100V - 240V AC ($\pm 10\%$)
50/60Hz
- 2) Output voltage (at 100V AC inputted):

Adapter mode	6.0V DC (constant voltage)
	1.5A DC (max.)
Charge mode	1.1A DC (constant current)
	10.0V DC (max.)

3. Battery pack charging

Charging method: Constant current quick charging system
Charging current: 1.1A
Charging time: approx. 80 minutes
Charging complete detection: Battery voltage drop detection

4. Environmental conditions:

Ambient temperature/humidity for operation 0°C - 40°C 85% RH
Ambient temperature/humidity for storage -30°C - 70°C 60% RH

5. Dimensions: 130 x 65 x 35(mm)

6. Weight: 350g approx.

1. Overview

The AC power supplied from a commercial receptacle flows through the primary noise filter circuit and fullwave-rectified and smoothed by D1, L2 and C7, then it becomes the DC power. Then it goes through T1 and becomes pulse current by Q1 which is switched by PWM signal (130 kHz approx.) outputted from pin 2 of IC51. By this pulse current, pulse voltage is generated at the secondary circuit. It is rectified and smoothed by D21, C21, C22, L21 etc., and outputted from the output terminal. The state of secondary side is fed back to the primary side by PHC1.

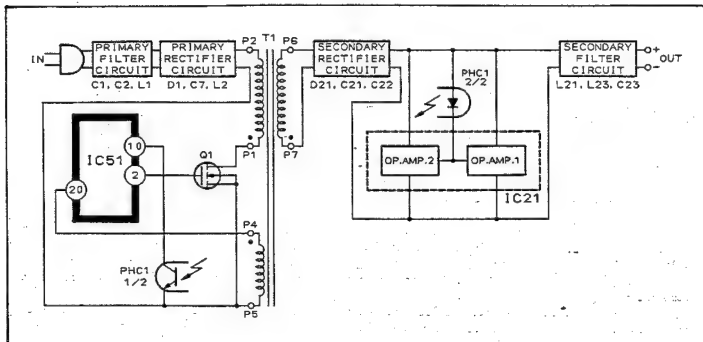


Fig. 1

2. Switching Circuit

When the power is supplied, starting voltage is applied to pin 20 of IC51 via R1-4 (starting resistances). IC51 starts to operate and outputs PWM signal (130kHz approx.) from pin 2. By the PWM signal, Q1 is switched over to control pulse current which flows pins 1 and 2 of T1.

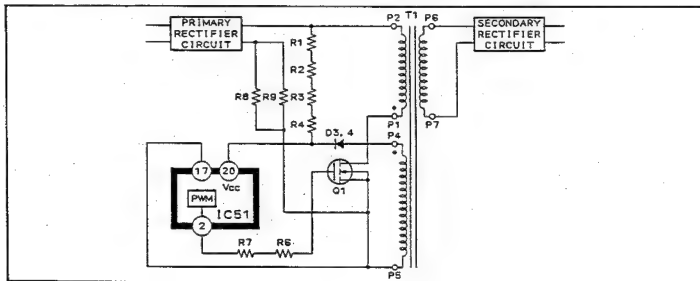


Fig. 2

3. Constant Voltage Circuit (in Adapter mode)

In adapter mode, C terminal goes high to turn off Q31 and 32. Zener voltage at ZD21 is divided by R42 and 44 and it is applied to (+) side of comparator 1 as a reference voltage. On the other hand, the voltage at output terminal (+) is divided by R45, 46 and VR21 and applied to the (-) side via R43 to be compared.

If the output voltage rises, it is regulated in the following manner.

- Output voltage rises (reference voltage for comparator 1) → Output of comparator decreased → Current (emission) of PHC-1 diode increased → Potential at pin 10 of IC51 decreased → High period of output at pin 2 of IC51 shortened → ON period at Q1 shortened → Drop of output voltage to constant level.

When the output voltage drops, it is raised to a constant voltage by reversing the above procedures.

In adapter mode, the comparator 2 regulates the excessive current. Zener voltage at ZD21 is divided by R31 and 32 and it is applied to the (+) side as a reference voltage. On the other hand, to the (-) side, the voltage at R22 and TF21 is applied to be compared. In this manner, the comparator 2 limits the current usually to 1.5A. However, the current which flows instantaneously is limited to 2.5A. (ex.: The rush current at the motor starting)

4. Constant Current Circuit (in charge mode)

CA-E7 regulates the charging current to 1.1A (maximum voltage: 11.0V approx.).

In charge mode, C terminal goes low to turn on Q31 and 32. R33 is connected between the (+) side of comparator 2 and ground via Q31 and then the potential drops. The charging current is converted into voltage by R22 and TF21 and then applied to the (-) side to be compared. On the other hand, to the (+) side of comparator 1, Q32, D32 and R40 are applied in parallel so that the reference voltage at the comparator 1 goes high.

The state of output at secondary circuit is fed to pin 10 of IC51 by PHC-1 as in the same manners in charge mode. IC51 controls the duty ratio at pin 2 to keep the output of secondary circuit properly.

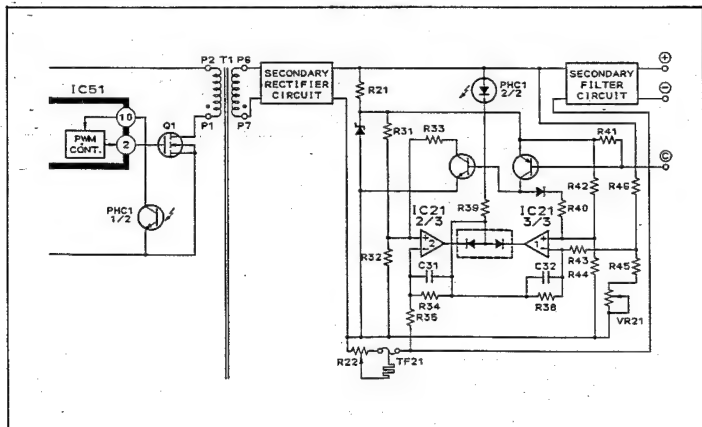


Fig. 3

5. Protection Circuit

When the voltage is applied to the primary circuit excessively, the voltage at pin 8 of IC51 goes high to operate the latch circuit, and then the PWM signal is stopped to be outputted.

To detect the excessive current, the current of primary circuit is converted into voltage by R8 and 9. (This voltage has the negative potential to ground.) It is fed to pin 18 of IC51 for detection.

For example, if the secondary circuit's output terminal is shorted and the excessive current appears, the circuit is protected in the following manners.

- Output terminal of secondary circuit shorted → Voltage at secondary circuit dropped → Emission of PHC1 photodiode stopped → Duty ratio of PWM output at pin 2 of IC51 increased → Current of primary side increased → Potential between R8, 9 and ground increased → Excessive current is detected at pin 18 of IC51 (negative potential) → Latch circuit in IC51 operated → PWM output stopped.

To reset the latch circuit operation, remove the causes (ex. shorting) of failure and emit the charge mainly at C7 fully by unplugging the power supply and leave it for 1 minute approximately.

Also, to protect the circuit from defective parts, F1 and TF21 (temperature fuse) are installed

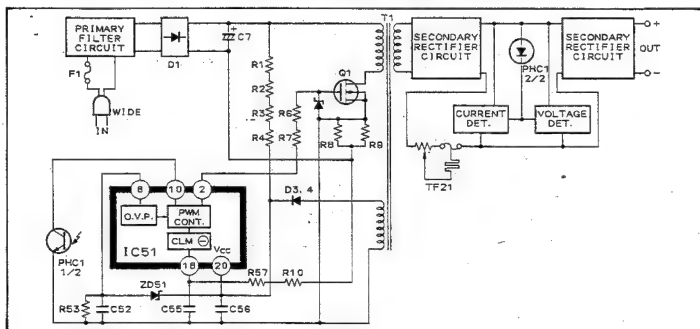


Fig. 4

Chapter III Adjustment

1. Output voltage adjustment

M. EQ.	Digital voltmeter
T.P.	Refer to Fig. 5
ADJ.	VR21
SPEC.	6.8 \pm 0.1V

* Note: Perform the adjustment without charges.

- (1) Remove the cover and the external shield case.
- (2) Connect (+) and (-) terminals of digital voltmeter to (+) and (-) on C.B.A. respectively.
- (3) Adjust the voltage to 6.8 \pm 0.1V.

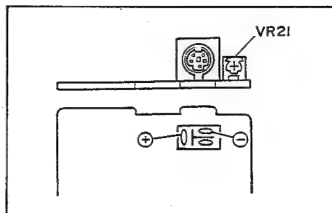
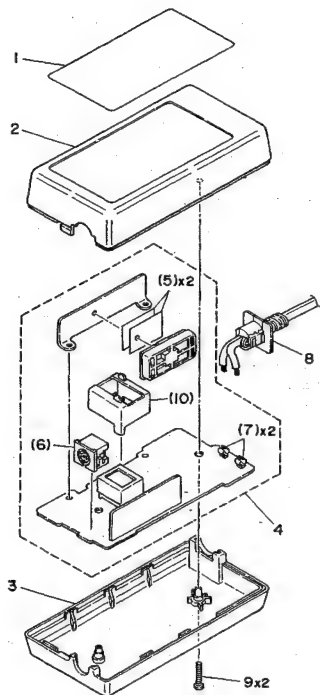


Fig. 5

Exploded Views



MECHANICAL PARTS

SYMBOL	PART NO.	CLASS	QTY	DESCRIPTION	REMARKS
△	1	DY2-4299-000 000	D 1	LABEL, CAUTION	VPAS80 ONLY
△	2	DY2-4286-000 000	D 1	CASE, UPPER	
△	3	DY2-4273-000 000	D 1	CASE, BOTTOM	
△	4	DY2-4285-000 000	S 1	MAIN C.B.A.	
△	5	DY2-4277-000 000	D 2	SHEET, INSULATION	
△	6	DY2-4287-000 000	C 1	CONNECTOR 5P	CA-E7E ONLY CA-E7B ONLY CA-E7AS ONLY
△	7	DY2-4276-000 000	D 2	CLIP, FUSE	
△	8	DY2-4288-000 000	D 1	CODE, POWER	
△		DY2-4289-000 000	D 1	CODE, POWER	
△		DY2-4290-000 000	D 1	CODE, POWER	
△	9	DY2-4275-000 000	F 2	SCREW, CROSS-RECESS	
△	10	DY2-4292-000 000	D 1	COVER, TRANSFORMER	

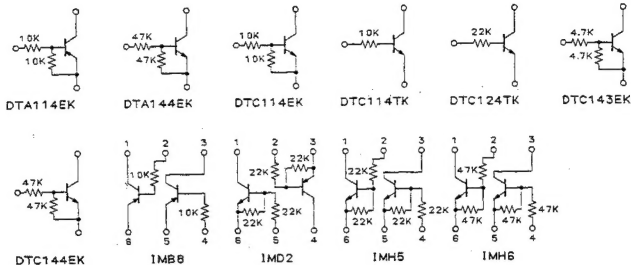
ELECTRICAL PARTS

SYMBOL	PART NO.	CLASS	QTY	DESCRIPTION	REMARKS
△	C1	Y22-2498-000	000	D 1	CAPACITOR, FILM 0.22μF 250V
△	C2	Y22-2284-000	000	D 1	CAPACITOR, FILM 0.047μF 250V
△	C3	Y22-2499-000	000	D 1	CAPACITOR, CERA. 4700pF
△	C4	Y22-2499-000	000	D 1	CAPACITOR, CERA. 4700pF
△	C5	Y22-2500-000	000	D 1	CAPACITOR, CERA. 3300pF
△	C6	Y22-2500-000	000	D 1	CAPACITOR, CERA. 3300pF
△	C7	Y22-1616-000	000	D 1	CAPACITOR, ELECT. 33μF 400V
△	C8	Y22-2313-000	000	D 1	CAPACITOR, FILM 0.047μF 400V
△	C12	Y22-2313-000	000	D 1	CAPACITOR, FILM 0.047μF 400V
△	C13	Y22-1642-000	000	D 1	CAPACITOR, CEAR. 1000pF
△	C14	Y22-2500-000	000	D 1	CAPACITOR, CERA. 3300pF
△	C15	Y22-2500-000	000	D 1	CAPACITOR, CERA. 3300pF
△	C21	Y22-2287-000	000	D 1	CAPACITOR, ELECT. 470μF 25V
△	C22	Y22-2287-000	000	D 1	CAPACITOR, ELECT. 470μF 25V
△	C23	Y22-2308-000	000	D 1	CAPACITOR, ELECT. 470μF 16V
△	D1	Y22-2059-000	000	D 1	DIODE S1WBA60
△	D2	Y22-2291-000	000	D 1	DIODE ERA22-08
△	D3	Y22-2309-000	000	B 1	DIODE ERA15-01
△	D4	Y22-2501-000	000	B 1	DIODE ERA22-06
△	D5	Y21-1411-000	000	B 1	DIODE MA165
△	D21	Y22-2502-000	000	D 1	DIODE ERC90M02
△	D31	Y21-1410-000	000	B 1	DIODE MA151WA
△	D32	Y21-1408-000	000	B 1	DIODE MA151A
△	F1	Y22-2503-000	000	D 1	FUSE 1A 250V
△	FT21	Y22-2300-000	000	D 1	FUSE 2A 250V
△	IC21	Y22-1132-000	000	B 1	IC AN6562S
△	IC51	Y22-2303-000	000	B 1	IC M51977FP
△	L1	Y22-2294-000	000	D 1	FILTER, LINE
△	L2	Y22-2504-000	000	D 1	COIL 25μH
△	L3	Y22-2505-000	000	D 1	COIL 560μH
△	L4	Y22-2506-000	000	D 1	BEAD, FERRATE
△	PHC1	Y22-2507-000	000	D 1	PHOTO COUPLER PC111
△	Q1	Y22-2288-000	000	D 1	FET 2SK903
△	Q31	WA2-0505-000	000	B 1	TRANSISTOR UN2211
△	Q32	Y22-2304-000	000	B 1	TRANSISTOR UN211E
△	R13	Y22-2510-000	000	D 1	RESISTOR 1MΩ
△	T1	Y22-2508-000	000	D 1	TRANSFORMER
△	ZD1	Y22-2289-000	000	B 1	DIODE, ZENER MA4200-M
△	ZD21	Y22-2290-000	000	B 1	DIODE, ZENER MA4051-M
△	ZD22	Y21-3655-000	000	D 1	DIODE, ZENER MA4150
△	ZD51	Y22-2301-000	000	B 1	DIODE, ZENER MA3330
△	ZD52	Y22-2302-000	000	B 1	DIODE, ZENER MA3047
△	ZD53	WA1-0520-000	000	B 1	DIODE, ZENER MA3200

PARTS LIST

PAGE	PART NO.	CLASS	QTY	DESCRIPTION	REMARKS
	DY2-4273-000	000	D 1	CASE, BOTTOM	
	DY2-4275-000	000	F 2	SCREW, CROSS-RECESS	
	DY2-4276-000	000	D 2	CLIP, FUSE	
	DY2-4277-000	000	D 2	SHEET, INSULATION PETP	
	DY2-4285-000	000	S 1	MAIN C.B.A.	
	DY2-4286-000	000	B 1	CASE, UPPER	
	DY2-4287-000	000	C 1	CONNECTOR 5P	
	DY2-4288-000	000	C 1	CODE, POWER	CA-E7E ONLY
	DY2-4289-000	000	C 1	CODE, POWER	CA-E7B ONLY
	DY2-4290-000	000	C 1	CODE, POWER	CA-E7AS ONLY
	DY2-4299-000	000	D 1	LABEL, CAUTION	VPA880 ONLY
	DY2-4292-000	000	D 1	COVER, TRANSFORMER	
	WA1-0520-000	000	B 1	DIODE, ZENER MA3200	
	WA2-0505-000	000	B 1	TRANSISTOR, UN2211	
	Y21-1408-000	000	B 1	DIODE MA151A	
	Y21-1410-000	000	B 1	DIODE MA151WA	
	Y21-1411-000	000	B 1	DIODE MA165	
	Y21-3655-000	000	D 1	DIODE, ZENER MA4150	
	Y22-1132-000	000	B 1	IC AN6562S	
	Y22-1616-000	000	D 1	CAPACITOR, ELECT. 33uF/400V	
	Y22-1642-000	000	D 1	CAPACITOR, CERA. 0.001uF	
	Y22-2059-000	000	D 1	DIODE S1WBA60	
	Y22-2284-000	000	D 1	CAPACITOR, FILM 250V 0.047uF	
	Y22-2287-000	000	D 2	CAPACITOR, ELECT. 25V 470uF	
	Y22-2288-000	000	D 1	FET 2SK903	
	Y22-2289-000	000	B 1	DIODE, ZENER MA4200-M	
	Y22-2290-000	000	B 1	DIODE, ZENER MA4051-M	
	Y22-2291-000	000	D 1	DIODE ERA22-08	
	Y22-2294-000	000	D 1	FILTER, LINE	
	Y22-2300-000	000	D 1	FUSE 2A 250V	
	Y22-2301-000	000	B 1	DIODE, ZENER MA3330	
	Y22-2302-000	000	B 1	DIODE, ZENER MA3047	
	Y22-2303-000	000	B 1	IC M51977FP	
	Y22-2304-000	000	B 1	TRANSISTOR UN211E	
	Y22-2308-000	000	D 1	CAPACITOR, ELECT. 16V 470uF	
	Y22-2309-000	000	B 1	DIODE ERA15-01	
	Y22-2498-000	000	D 1	CAPACITOR, FILM 0.22uF/250V	
	Y22-2499-000	000	D 1	CAPACITOR, CERA. 4700pF	
	Y22-2500-000	000	D 1	CAPACITOR, CERA. 3300pF	
	Y22-2501-000	000	B 1	DIODE ERA22-06	
	Y22-2502-000	000	B 1	DIODE ERC90M02	
	Y22-2503-000	000	D 1	FUSE 250V 1A	
	Y22-2504-000	000	D 1	COIL 25uH	
	Y22-2505-000	000	D 1	COIL 560uH	
	Y22-2506-000	000	D 1	BEAD, FERRITE	
	Y22-2507-000	000	D 1	PHOTO COUPLER PC111	
	Y22-2508-000	000	D 1	TRANSFORMER	
	Y22-2510-000	000	D 1	RESISTOR 1MΩ	
	Y22-2512-000	000	C 1	CAPACITOR, FILM 400V/0.047uF	

2. Equivalent circuits of digital transistor



3. Indications on circuit diagram

- * Resistance is represented in ohms (Ω).
- * Capacitance is represented in farads (F).
- * Voltages of capacitor are 25 V unless otherwise specified.
- * Wattage of resistor is 1/16 W unless otherwise specified.
- * Voltages are measured with a digital voltmeter.
- * Waveform photographs are taken by using a 10:1 probe.
- * IC No. in each C.B.A.s are listed on the bottom of diagrams.
- * No. colored in blue are corresponded to the No. of waveform photographs.
- * Voltage values indicated in circuit diagram are based on the following condition.

Camera section

Color bar, standard angle of view, AWB-preset

Recorder section

Recording : Color bar (pattern generator)

Playback : Self-recording Playback (Color bar)

